FLIGHT

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM.

No. 284. (No. 23, Vol. VI.)] JUNE 5, 1914. [Registered at the G.P.O. as a Newspaper.] [Weekly, Price 3d. Post Free, 3½d.

Flight.

Editorial Office: 44, ST. MARTIN'S LANE, LONDON, W.C.
Telegrams: Truditur, Westrand, London. Telephone: Gerrard 1828.
Annual Subscription Rates, Post Free.
United Kingdom ... 15s. 0d. Abroad ... ... 20s. 0d.

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EDITORIAL COMMENT.

The Army Air Manœuvres.

The present concentration of the Royal Flying Corps at Netheravon should set at rest the minds of those who still will have it that we are doing nothing—or next to nothing—to bring our aerial defences into line with modern requirements. Seventy machines, over a hundred flying officers, 150 transport vehicles, and a staff of 650 air-mechanics, makes a fairly respectable showing for a small army like our own. In fact, so far as the records are there to show, it is the largest concentration of aerial strength that has been seen in any army, large or small. On this much we are justified in priding ourselves, and the more so because we felt that our personnel is at least equal to, and probably better than, that of any other of the Great Powers. There is this reservation to be made, however, that we must not allow the present, magnificent as it may seem, to blind us to the needs of the future. It is always possible to misread these object-lessons unless one is particularly careful to view things in their true proportions. What we mean is this: by a process of exhaustive concentration, in which the Army authorities have called up for concentration the uttermost available unit, we are able to show to the world the greatest aerial force that has ever assembled in one place, and, on the face of it, the lesson might be taken to read that we have reached an absolutely unassailable position in the air. In fact, the unthinking might easily take it to mean the same as the enormous demonstrations of naval strength that Britain occasionally shows to a wondering world when our Government deems it necessary to give to some other Power a more or less friendly hint of the strength and preparedness of the British Navy. In the last case, indubitably the strength is there, and the whole world knows it is, so that the lesson is not lost. But in the case of our air forces, the world at large knows as well as we ourselves that it would tax our resources to the utmost to put another machine or man into the field, and the lesson is thus lost upon a possible rival. On the British public the impression might easily be something quite different. Here, they might say, is the most wonderful assemblage of aeroplanes the world has ever seen. Who said that the Government was neglecting the aerial branch of our national defences? And on the face of things there is only one answer to this query, but when we go deeper there may be quite another. We are not suggesting at all that this concentration has been devised for merely spectacular effect, but it will possibly be as well if the observer will keep his mind perfectly clear in the matter, and will realise that this concentration is one of our uttermost man and machine. What France or Germany could do under similar circumstances we frankly do not know further than they could make a much better numerical showing, and one which would doubtless impress the world with a feeling that whichever had thought it worth while to carry out must be in a state of preponderating strength. Which might, or might not, be the case. The main point is that we do not want to allow the merely spectacular to blind us to the real state of things. A lot of progress has been made recently, but we still have a long way to go before we can rest assured that our position is absolutely a safe one, or even comparable to that of our rivals.

It is not, however, our purpose to gird at the Government. All we are concerned with at the moment is that the public shall not receive a false impression of things, but rather that they should remember that, wonderful as is the muster at Netheravon, it could easily be beaten abroad if only the leaders among the Great Powers chose to go out of their way to give a real demonstration of aerial strength.

So far as concerns the manœuvres themselves, the lessons that are being learned are mainly such as will appeal to the professional rather than the lay mind, and it would be somewhat out of place were we to attempt to dogmatise on them. In a general way, however, it may be said that they must have an enormous bearing on the future of war in the air, since it is apparent from what is allowed to transpire, that the tests through which the

pilots and their machines are being put are exhaustive in the extreme. The whole gamut of military operations in relation to aircraft is being gone through with a thoroughness characteristic of modern soldiership. Apparently, great stress is being laid on flying by night, and it seems to have already been pretty clearly proved that aircraft—aeroplanes as well as dirigibles—will be of almost incalculable use during the hours of darkness. The flights that have been made over the camps are earnest of this. If the reports are to be trusted, it would seem that aeroplanes actually passed low over points of concentration without being seen at all, although the pickets and sentries were on the look-out and actually were able to locate their approximate whereabouts by the sound of the motors. If the conditions really reproduced were war conditions, then something has been learned of the possibilities of night operations against camps and bivouacs. Then, a great many signalling and wireless experiments have been carried out, and apparently with uniform success. Another operation which at the time of writing has not been carried out but which it is understood is to be tried, is that of sending out a number of machines to search for and destroy the enemy's air fleet. It is impossible to reproduce the conditions of actual war in these things, but even so it may be taken for granted that much will be learnt which will prove of extreme value. In conclusion, we can only say that the whole business of the concentration is well conceived and seems to have been as well carried out. That our soldier-aviators will profit by the lessons they will learn we know them too well to doubt.

ROYAL FLYING CORPS.

THE following appeared in the *London Gazette* of the 2nd inst. :—

R.F.C. Military Wing.—*Supplementary to Regular Corps.*—Second Lieut. (on probation) Henri C. A. de la F. Biard resigns his commission. Dated June 3rd, 1914.

ROYAL FLYING CORPS (MILITARY WING).

WAR OFFICE summary of work for week ending May 30th, 1914 :—

No. 2 Squadron.—During the week No. 2 Squadron, with aircraft, mechanical transport and *personnel*, proceeded to Northampton from Lincoln, thence to Oxford. They all arrived at Netheravon on the 30th, and are now engaged in settling in to the Military Wing Concentration Camp.

No. 3 Squadron.—Reconnaissance flights were made daily over Salisbury Plain and the surrounding district.

No. 4 Squadron.—The pilots of this squadron were out practising observation every day.

Nos. 5 and 6 Squadrons.—Cross-country reconnaissances were made daily, the machines of both squadrons arrived at Netheravon for the Concentration Camp on the 29th and 30th. All mechanical transport and *personnel* followed by road and rail.

Nos. 1 and 7 Squadrons.—These squadrons will remain at Farnborough during the concentration at Netheravon. Besides reconnaissance work they will be occupied with technical training.

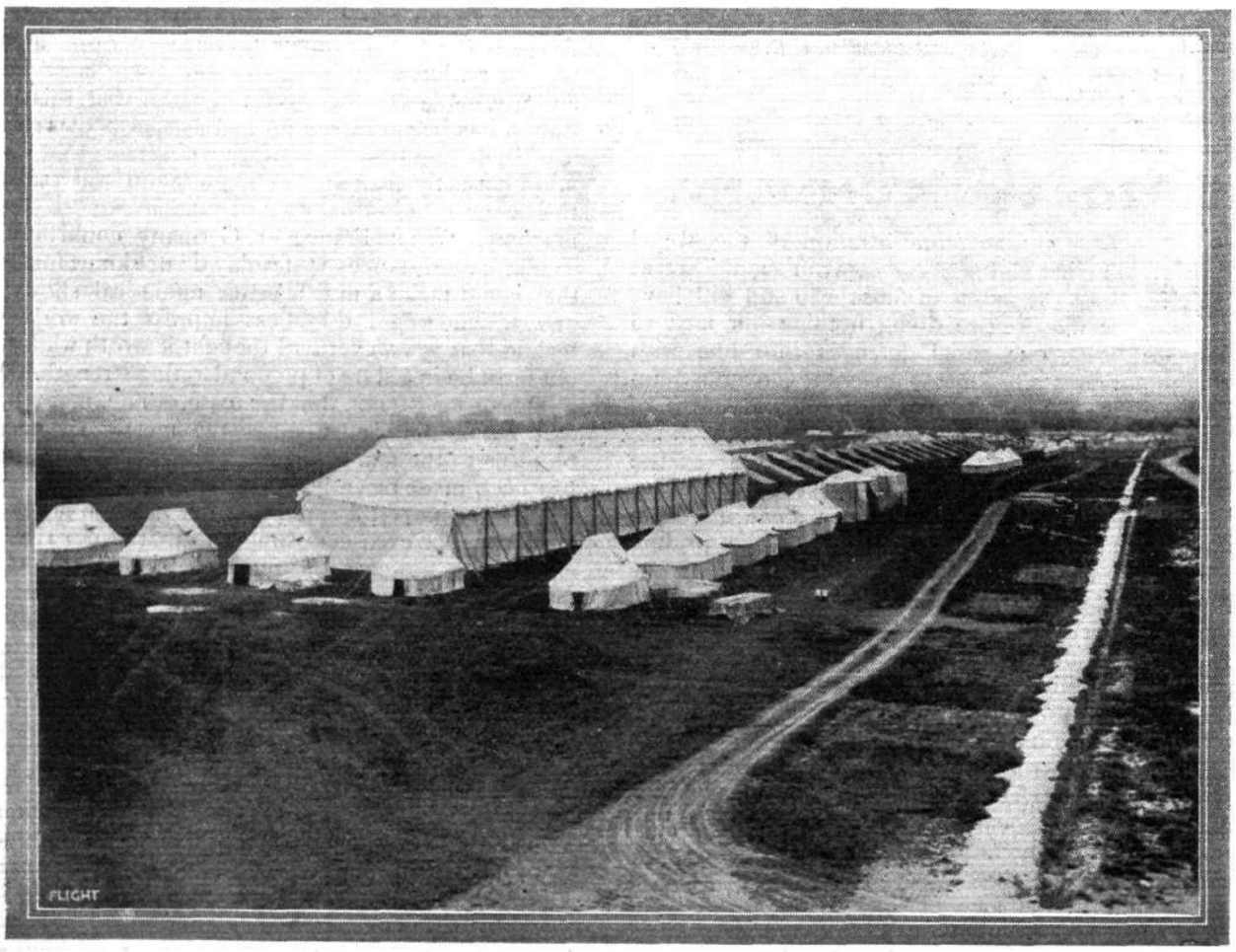
Headquarter Flight.—During the week this unit was engaged in experimental work ; the machines, mechanical transport and *personnel* reached Netheravon on the 30th ult.

Aircraft Park.—The Aircraft Park have sent on some of their plant to Netheravon. The remainder of the *personnel* and mechanical transport will proceed on June 1st.

General News.—The machines and nearly all the *personnel* have arrived at Netheravon for the Concentration Camp.

A co-ordinated programme of progressive training has been drawn up by the Officer Commanding the Military Wing. The programme includes combined aircraft exercises and reconnaissances, mechanical transport convoy work, mobilization practice and lectures and conferences on military and technical subjects.

Advantage will also be taken of the concentration to hold various inter-squadron and Military Wing athletic competitions.



THE R.F.C. UNDER CANVAS AT NETHERAVON, SALISBURY PLAIN.—A general view of the camp.

FLIGHT

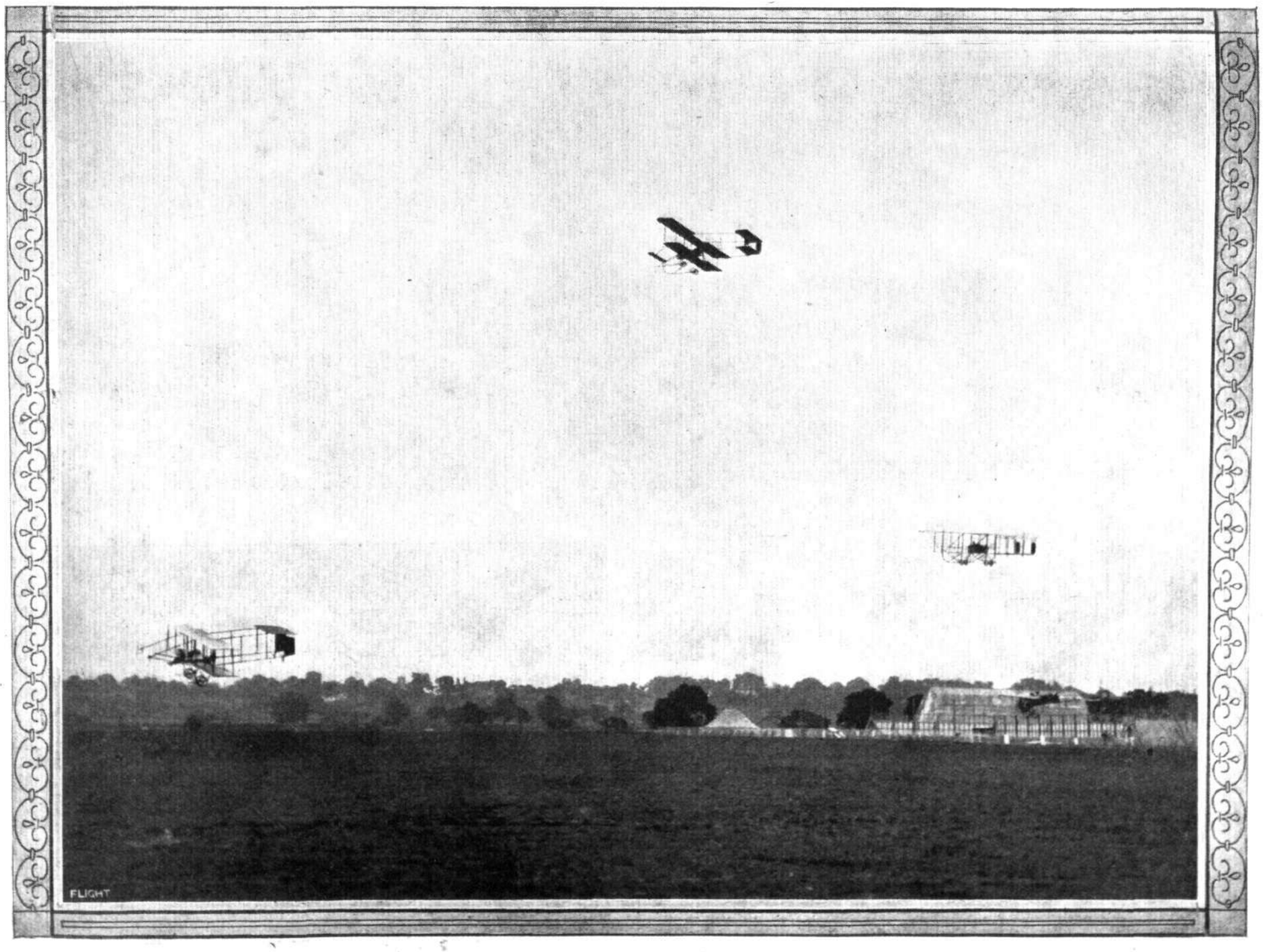
MEN OF MOMENT IN THE WORLD OF FLIGHT.

LORD CARBERY, the well-known amateur who flies a Morane for sport. He made a surprise flight from Paris to London in the middle of last August, soon after securing his *brevet*. He has entered for the Aerial Derby.

FLYING AT HENDON.

THE Eighth London Aviation Meeting, which opened at Hendon on Saturday afternoon last and closed on Whit-Monday, was one of the best shows that has been seen at the aerodrome for some time, for in addition to numerous exhibition flights there was excellent racing on the Saturday and Monday. On both these days the weather was fine though somewhat windy, but on the Sunday showers of rain rendered the proceedings a trifle unpleasant; the attendance on each occasion was also very good. The new Viennese orchestra and Miss Murray's singing in the paddock enclosure were much appreciated. Saturday's proceedings opened shortly before 3 o'clock with exhibitions by R. J. Lillywhite and N. Howarth on the G.-W. bi-rudder 'bus, Louis Noel on the 70 h.p. Maurice Farman, and R. H. Carr with a passenger on the 80 h.p. Blériot. F. W. Goodden then ascended on the 80 h.p. Morane-Saulnier and gave a demonstration of looping the loop, for the first time in public, executing three single loops at altitudes of about 1,000 ft. and two tail slides. Noel in the meanwhile made two passenger flights in the Maurice Farman, whilst W. Brock blossomed forth as a Morane pilot. His first flight was short, as engine trouble let him down at the far end of the aerodrome, but after some adjustments had been made he put up a longer and more successful flight. Noel then tried an 80 h.p. Le Rhone-Henry Farman—the same machine on which P. Verrier made an attempt for the Monaco rally just recently—which has been acquired by the Grahame-White Co., and Carr and Verrier gave exhibitions on the G.-W. tractor biplane "Lizzie" and a 70 h.p. Maurice Farman respectively. Verrier performed all sorts of "stunts," including nearly a circuit of the aerodrome standing up in the *nacelle* waving his arms about. The first heat (4 laps) of the speed handicap for the "Daily Telegraph" Cup was then flown, there being five starters as follows:—A. E. Barrs on G.-W. 'bus No. 107 (2 mins. 25 secs.); N. Howarth on G.-W. 'bus No. 109 (2 mins. 6 secs.); R. H. Carr on "Lizzie" (1 min. 3 secs.); W. L. Brock on the 80 h.p. Blériot (22 secs.); and F. W. Goodden on the 80 h.p. Morane-Saulnier (scratch). All got away without incident with the exception of Goodden who met with a mishap in starting which might, but for his presence of mind, have resulted in a very serious accident. As his machine started on the fall of the flag it made a sudden swerve to the right and went straight for the enclosure railings behind which were sitting a number of spectators. Although Goodden switched off immediately, the machine continued on its course with some considerable force, so he shoved the control lever far forward in order to bring the machine on its nose and so prevent it from dashing into the crowd. In this he was partially successful, for as the machine crashed into the railings it turned over on its nose, and according to rumour, hit the back of a taxi-cab with its tail. Fortunately the spectators managed to jump clear and no one was injured in any way, whilst Goodden, who had strapped himself in as it was his intention to loop the loop after the race, remained intact in his seat. All the damage done, therefore, was a broken propeller, slightly injured planes, and some half-a-dozen chairs (but recently occupied) demolished. The machine was soon brought back to a more dignified position and returned to its hangar, and we were then able to turn our attention to the progress of the race. Barrs, who was flying his first race in fine style, maintained the lead throughout, whilst Carr made a fine effort to obtain first place which he lost by one second, Brock being third 14 seconds behind him. Whilst this heat was in progress J. L. Hall had ascended on his 50 h.p. Avro to an altitude of several thousand feet, from which height he descended *à la mode* with his engine stopped. The second heat of the speed race resulted in a magnificent finish, all four competitors coming home within two seconds. The starters for this heat were:—R. J. Lillywhite on the G.-W. bi-rudder 'bus (1 min. 55 secs.); W. Birchenough on his new mount—which he handles in fine style—the Maurice Farman (1 min. 7 secs.);

HENDON AERIAL DERBY.—A view of the enclosures.—*Verb. Sap.*: Go early.



" Flight " Copyright.

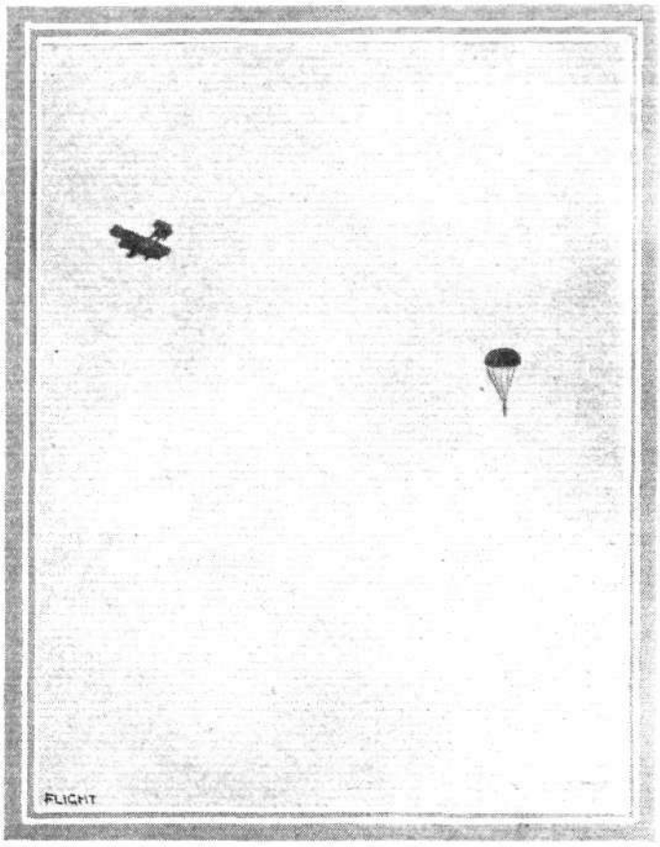
RACING AT HENDON.—The second heat of the Speed Handicap on Whit Saturday. From left to right the machines are: Messrs. R. J. Lillywhite (G.-W. twin rudder), Verrier (Maurice Farman), W. Birchenough (G.-W.-Maurice Farman), and L. Noel (Blériot).

P. Verrier also on a Maurice Farman (50 secs.); and Louis Noel with a passenger on the 80 h.p. Blériot (scratch). They all kept in the order in which they started until the end of the last lap, when Verrier and Birchenough changed places. Lillywhite, therefore, came in first with Verrier second, only $\frac{1}{5}$ sec. behind and $\frac{4}{5}$ sec. ahead of Birchenough, Noel being last 1 sec. behind the latter. Immediately after the third heat W. Newell made his first public demonstration of a parachute descent from an aeroplane. A special platform had been fitted on the front of the left skid of the 100 h.p. Grahame-White aerobus, whilst a rope seat was provided on the chassis struts. Having taken his position with the parachute on his lap, the aerobus with Carr as pilot, Goodden as "pusher off," and Chapman as mechanic, ascended to a height of 2,000 feet, where Newell made a head-first dive to earth with the parachute behind him. He fell some three or four hundred feet before the parachute opened and let him down gracefully into a field just outside the aerodrome behind the railway, the descent taking 2 mins. 8 secs. Just before the final heat of the speed handicap was flown two passengers were taken up by Noel and Lillywhite on the Maurice Farman and the bi-rudder 'bus respectively, whilst M. Zubiaga ascended on his 60 h.p. Gnome Caudron biplane which he damaged somewhat on landing. The final heat of six laps provided plenty of excitement, especially when the machines were rounding No. 6 pylon on the last lap, when Carr had to turn out of the course in order to avoid a collision. Verrier crossed the line first 12 secs. ahead of Barrs, Lillywhite being third 4 secs. behind the latter.

Result of the Final Heat. (6 laps.)	Handicap.	Handicap Time.
	m. s.	m. s.
1. P. Verrier (70 h.p. Maurice Farman biplane)	0 47	11 57
2. A. E. Barrs (50 h.p. G.-W. biplane) ...	2 48	12 9
3. R. J. Lillywhite (50 h.p. G.-W. biplane) ...	2 32	12 13
R. H. Carr (50 h.p. G.-W. tractor biplane)	scratch	retired

Before the proceedings were brought to a close several more exhibition and passenger flights were made, including a looping demonstration by Carr on "Lizzie." Hall took the writer for a "joy ride" up to about 2,000 ft. and demonstrated the excellent gliding properties of his 50 h.p. Avro, which is now in splendid form and certainly flies very steadily. For a tractor biplane the observation qualities of this machine are remarkably good. Claude Grahame-White made a flight towards the end of the evening on the Henry Farman.

Mr. W. Newell, who has been again making parachute descents at Hendon, comfortably tucked up on his perch, prior to a descent last week-end.



Mr. W. Newell's parachute descent from aeroplane at Hendon—a distant snap taken a few moments after he had parted from the aeroplane.

As previously mentioned, a drizzling rain on Sunday prevented much flying from taking place. Many of the Hendon pilots, however, gave exhibitions. Louis Noel was out on the 80 h.p Henry Farman, W. Birchenough and P. Verrier flew Maurice Farmans, and various members of the Grahame-White stud went up on the G.-W. 'buses. R. H. Carr also gave a demonstration of looping on "Lizzie." J. L. Hall made pretty flights and glides on his 50 h.p. Avro.

Whit-Monday was a very busy day, and two racing events were down on the programme, a 9-mile speed handicap of two heats of four laps each and a final heat of six laps for the Hendon Cup, and a 30-mile cross-country handicap for the Giesler Challenge Trophy and a purse of 100 gns. The weather was ideal, and spectators arrived on the scene as early as noon, from which time until the start of the first heat of the speed handicap at 2.30 p.m., numerous exhibition and passenger flights were made, including a fine altitude flight by W. L. Brock on the 80 h.p. Morane-Saulnier, during which he reached an altitude of 8,300 ft. Unfortunately this splendid flight terminated with a slight mishap on landing, which resulted in a smashed propeller and other minor injuries to the machine, but none to the pilot. The first heat of the speed handicap produced five starters as follows:—N. Howarth on a 50 h.p. G.-W. 'bus (2 mins. 55 secs.); R. J. Lillywhite on a similar machine (1 min. 55 secs.); W. Birchenough on the 70 h.p. Maurice Farman (1 min. 22 secs.); Louis Noel on the 80 h.p. Henry Farman (37 secs.); and W. L. Brock on the 80 h.p. Blériot (scratch). The finish of the heat was one of the closest seen at Hendon for some time, for Noel and Birchenough both flew a very fine course and put up an exciting fight for first place, which Noel obtained by a bare $\frac{1}{5}$ sec. The scratch man, Brock, came in a good third, $\frac{2}{5}$ sec. behind Birchenough, and $\frac{4}{5}$ sec. in front of Lillywhite who took his pylons in really excellent style and maintained the lead until the last moment. Five also started in the second heat, viz.: E. F. Norris (2 mins. 47 secs.) and A. E. Barrs (2 mins. 10 secs.) on G.-W. 'buses, P. Verrier on a 70 h.p. Maurice Farman (36 secs.), C. Grahame-White on "Lizzie" (20 secs.), and R. H. Carr on the 80 h.p. Blériot (scratch). Norris and Barrs kept ahead all the time, the latter gradually catching up Norris, who crossed the line first, but at the last moment Grahame-White overhauled Barrs, and obtained second place by 1 sec., 13 secs. behind Norris. Carr came in fourth, 13 secs. after Barrs, but Verrier retired. Before flying the final heat a start was made for the cross-country handicap, for which there were six starters. These were:—R. J.

Lillywhite on the bi-rudder 'bus (7 mins. 55 secs.); W. Birchenough on the Maurice Farman (5 mins. 25 secs.); P. Verrier on another Maurice Farman (3 mins. 27 secs.); Louis Noel on the Henry Farman (2 mins. 5 secs.); R. H. Carr on "Lizzie" (1 min. 55 secs.); and W. L. Brock on the Blériot (scratch). The course was six laps of the Bittacy Hill circuit. This race also produced an exciting finish, for on the last lap the machines returned in a bunch. Noel crossed the line first, and 43 secs. after, Brock, who had dived in under the two Maurice Farmans which were racing side by side, came in second. Neither Birchenough nor Verrier gained on the other and they crossed the line together, a perfect dead heat, 7⅘ secs. behind Brock. Lillywhite came in next, but Carr had to retire on the fifth lap owing to engine trouble. Immediately after the race Mr. Forestier, on behalf of the Giesler Champagne Co., presented Noel with the cup—containing Giesler champagne—and said that he hoped to do the same next year. After passing the cup round (with the champagne) cheers were given for Louis Noel and Mr. Forestier, and then the final of the speed handicap was flown. The starters in this heat were:—E. F. Norris on 'bus 109 (2 mins. 57 secs.); W. Birchenough on the Maurice Farman (1 min. 21 secs.); C. Grahame-White on "Lizzie" (15 secs.); and Louis Noel on the Henry Farman (scratch). The first home was Grahame-White, Birchenough coming in second only ⅘ sec. behind, and Noel third 3⅘ secs. after. Shortly after the race Carr took up four ladies on the aerobus and Grahame-White gave Mr. Forestier a trip on the Maurice Farman, whilst Hall on his Avro, and Howarth and Norris on the 'buses gave exhibitions. Then Carr on "Lizzie" and Goodden on the repaired Morane-Saulnier gave a combined demonstration of looping, Carr making six loops at altitudes varying from 1,000 to 800 ft., and Goodden in addition to looping executed a tail slide. Before the proceedings were brought to a close, passengers were taken up by Lillywhite on the bi-rudder 'bus, Birchenough on the Maurice Farman, Noel on the Henry Farman, and Carr on the Blériot. Hall also made a flight on his Avro, descending with his engine stopped to a few hundred feet of the ground, and then diving and starting the engine again. Further exhibitions were also given by Barrs, who made a fine high flight on the bi-rudder 'bus, Howarth on the same machine, Goodden on the Morane-Saulnier, and Noel on the Maurice Farman on which he executed a pretty *vols sans force*.

Final Heat of Speed Handicap. (6 laps).	Handicap. m. s.	Handicap Time. m. s.
1. C. Grahame-White (50 h.p. G.-W. tractor biplane)	0 15	11 47
2. W. Birchenough (70 h.p. M. Farman biplane)	1 21	11 47⅘
3. Louis Noel (80 h.p. Henry Farman biplane)	scratch	11 51
4. E. F. Norris (50 h.p. G.-W. biplane) ...	2 57	12 22

Cross-Country Handicap (30 Miles) for the Giesler Trophy.		
1. Louis Noel (80 h.p. Henry Farman biplane)	2 5	31 18
2. W. L. Brock (80 h.p. Blériot monoplane)...	scratch	32 1
3. W. Birchenough (70 h.p. M. Farman biplane) / P. Verrier (70 h.p. Maurice Farman biplane)	5 25 / 3 27	32 8⅘
4. R. J. Lillywhite (50 h.p. G.-W. biplane) ...	7 55	33 56
R. H. Carr (50 h.p. G.-W. tractor biplane)	1 55	retired

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THE AERIAL DERBY, 1914.

(Postponed from May 23rd.)

TO-MORROW (Saturday) the Aerial Derby round London will take place, starting from the London Aerodrome, Hendon, at 4.15 p.m. This race, it will be remembered, was to have been flown on May 23rd last, but had to be postponed on account of the unfavourable weather. In our issue of May 22nd we published full particulars of all the machines, as well as photographs and silhouettes, to enable our readers to easily identify the various machines as they passed overhead. In addition we published portraits of the pilots and a key map and detailed maps of the course.

A comparison of the table of pilots and machines printed on this page, with the similar table in our issue of May 22nd, will show that the number of machines entered remains the same, but that some of the machines and pilots have been replaced by others. The new comers are Bjorkland on a Blériot, W. Birchenough on a M. Farman, and W. L. Brock on a Morane. In our present issue we again publish silhouettes of the various types of machines with their new numbers, and in addition we give portraits of the three pilots who were not entered in the previous list. For full particulars of the machines, and other portraits of the pilots, we therefore refer our readers to our issue of May 22nd last, in which they were all fully dealt with, and which forms, in fact, a complete guide to the race.

The course—a complete circuit of London—covers a distance of 95 miles, and after leaving the Hendon Aerodrome at 4.15 p.m. the aviators, passing over Wembley, Ealing, and Hounslow, will make for the first turning-point at Kempton Park, *i.e.*, a square brick chimney, 230 ft. high, just north of Kempton Railway Station. They will then head towards Epsom, and after rounding the grand stand at the top of the downs, will enter the longest section of the course, passing near Croydon, Beckenham, Bromley, Sidcup, Bexley and Dartford, then crossing the Thames to West Thurrock, where the turning point is the cement works slightly to the east of West Thurrock Church. At this point the airmen will have covered 51 miles, more than half the course, and the real struggle will commence. The machines enter the fourth section, setting their course for Epping, and after passing round Epping Church Tower, they will steer for Hertford, the last point on their homeward journey, passing Broxbourne. From Hertford, where the turning point will be indicated by a large white cross in a field adjoining the railway station north of the town, the pilots will make their final dash to the finishing line at the Hendon Aerodrome, passing near Potter's Bar, High Barnet, and Mill Hill, the winner being expected to arrive shortly after 5 p.m.

In addition to the *Daily Mail* Gold Cup and the Shell £250 prize for the fastest time, a sealed handicap for the Shell trophy and a £100 prize will be run off in connection with the race, whilst the second and third men will receive £75 and £25 respectively.

Special accommodation has been provided in the aerodrome enclosures, which will open at 12 noon, and it is announced that looping displays and passenger flights will be given from 1 p.m. to 4 p.m. and at intervals during the afternoon.

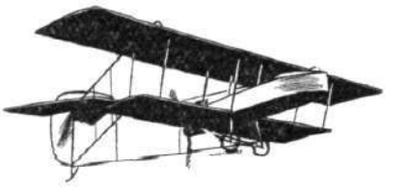
AERIAL DERBY, JUNE 6th. Particulars of Machines, &c.

New No.	Old No.	Pilot.		Machine.		Type.	Engine.
							h.p.
1	—	Filip Bjorkland	Sw.	Blériot	F.	Monoplane ...	50 Gnome
2	—	W. Birchenough	B.	M. Farman	F.	Biplane ...	70 Renault
3	2	R. H. Carr	B.	Grahame-White	B.	Biplane ...	50 Gnome
4	3	M. Zubiaga	Sp.	Caudron	F.	Biplane ...	60 Gnome
5	11	L. Noel	F.	H. Farman	F.	Biplane ...	80 Le Rhone
6	4	P. Verrier	F.	H. Farman	F.	Biplane ...	80 Gnome
7	5	J. Blatherwick	B.	Martinsyde	B.	Biplane ...	65 Antoinette
8	6	L. A. Strange	B.	Blériot	F.	Monoplane ...	80 Gnome
9	7	J. Alcock	B.	M. Farman	F.	Biplane ...	100 Sunbeam
10	8	W. R. Ding	B.	Handley Page	B.	Biplane ...	100 Anzani
11	10	F. Goodden	B.	Morane	B.	Monoplane ...	80 Gnome
12	—	W. L. Brock	U.S.	Morane	B.	Monoplane ...	80 Gnome
13	—	Name of pilot to be announced		Morane		Biplane ...	80 Gnome
14	12	Lord Carbery	B.	Morane	F.	Monoplane ...	80 Le Rhone
15	13	H. Blackburn	B.	Avro	B.	Biplane ...	80 Gnome
16	15	R. H. Barnwell	B.	Vickers	B.	Biplane ...	100 Gnome
17	16	V. Waterfall	B.	Martinsyde	B.	Monoplane ...	120 Austro-Daimler
18	19	Name of pilot to be announced		Sopwith	B.	Biplane ...	80 Gnome
19	9	S. V. Sippe	B.	Bristol	B.	Biplane ...	80 Gnome
20	14	F. P. Raynham	B.	Avro	B.	Biplane ...	80 Gnome
21	20	H. Pixton	B.	Sopwith	B.	Biplane ...	100 Gnome

Sp. = Spanish. B. = British. Sw. = Swedish. F. = French. U.S. = United States.

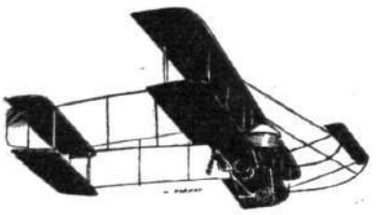
HOW TO RECOGNISE THE MACHINES.

Blériot Monoplane.
No. 1. Filip Bjorkland.
No. 8. L. A. Strange.

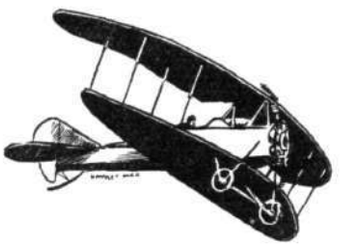


Martinsyde Biplane.
No. 7. J. Blatherwick.

Martinsyde Monoplane.
No. 17. V. Waterfall.

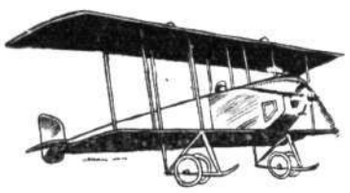


M. Farman Biplane.
No. 2. W. Birchenough.
No. 9. J. Alcock.

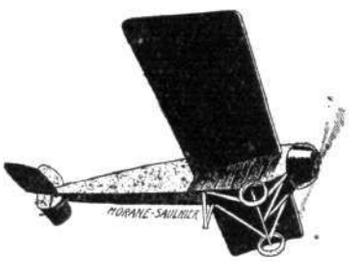


Handley Page Biplane.
No. 10. W. R. Ding.

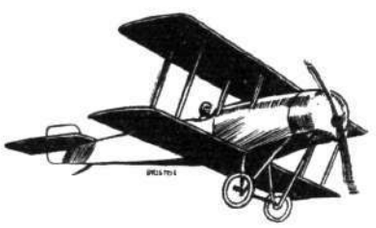
Sopwith Biplane.
No. 18. Pilot not announced.



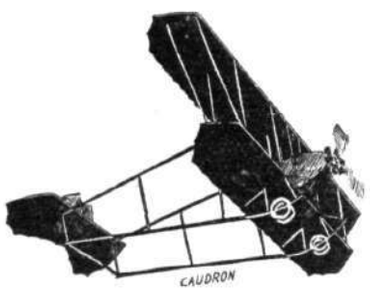
Grahame-White Biplane.
No. 3. R. H. Carr.



Morane-Saulnier Monoplane.
No. 11. F. Goodden.
No. 12. W. L. Brock.
No. 13. Pilot not announced.
No. 14. Lord Carbery.



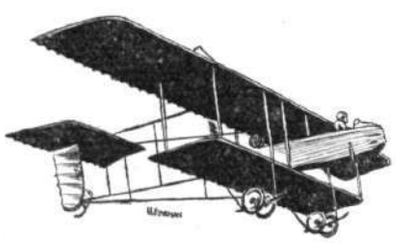
Bristol Biplane.
No. 19. S. V. Sippe.



Caudron Biplane.
No. 4. M. Zubiaga.

Avro Biplane.
No. 15. H. Blackburn.

Avro Scout Biplane.
No. 20. F. P. Raynham.



H. Farman Biplane.
No. 5. L. Noel.
No. 6. P. Verrier.

Vickers Biplane.
No. 16. R. H. Barnwell.

Sopwith Biplane.
No. 21. C. H. Pixton.

From the above silhouettes it will be seen that of the 21 machines entered 7 are monoplanes, 9 tractor biplanes and 5 "pusher" biplanes. The Blériot monoplanes may be recognised by their rounded wing tips and open *fuselage*, and the Moranes by the enclosed *fuselage* and angular wing tips. The Martinsyde monoplane will be easily identified by its long narrow *fuselage* and tapering wings. Of the tractor biplanes the Handley Page is characterised by crescent-shaped wings, whilst the wings of the Avro scout slope backwards. The Sopwith and Bristol scouts may be identified by bearing in mind that the Sopwith has its planes set at a dihedral angle and its chassis fitted with skids, whilst the Bristol has straight wings and no chassis skids. The Vickers biplane resembles the Sopwith and Bristol, but has a wider *fuselage*. The Grahame-White biplane differs from the other above-mentioned tractor biplanes in that the upper plane is of larger span than the lower one, whilst the gap between the planes is unusually large. The Caudron biplane, although of the tractor type, has its tail planes carried on an outrigger similar to those of the "pusher" biplanes. Of the machines belonging to the latter type the two M. Farmans may be recognised by their front elevator, whilst the H. Farmans are characterised by the large overhang of their upper planes. The Martinsyde biplane resembles the H. Farmans, but has staggered planes.

Filip Bjorkland (No. 1).

W. Birchenough (No. 2).

W. L. Brock (No. 12).

AERIAL DERBY.—The three new pilots.

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EDDIES.

RAYNHAM, "the Glider," had a few very exciting moments the other Sunday, when flying from Hendon to Brooklands on the little Avro scout. When about five or six miles from Brooklands his engine wrenched the rear engine plate loose and twisted round until the magneto and oil pump, &c., were up against the top of the *fuselage*. As by this time the connections had been broken the engine stopped. Raynham then thought it was about time to look for a likely-looking field in which to land, but finding that he had a following wind he decided to try and reach Brooklands aerodrome. Thanks to the excellent gliding angle of the Avro scout he succeeded in making the "bowl" at a sufficient altitude to make a half turn and land head to wind in front of the "Blue Bird."

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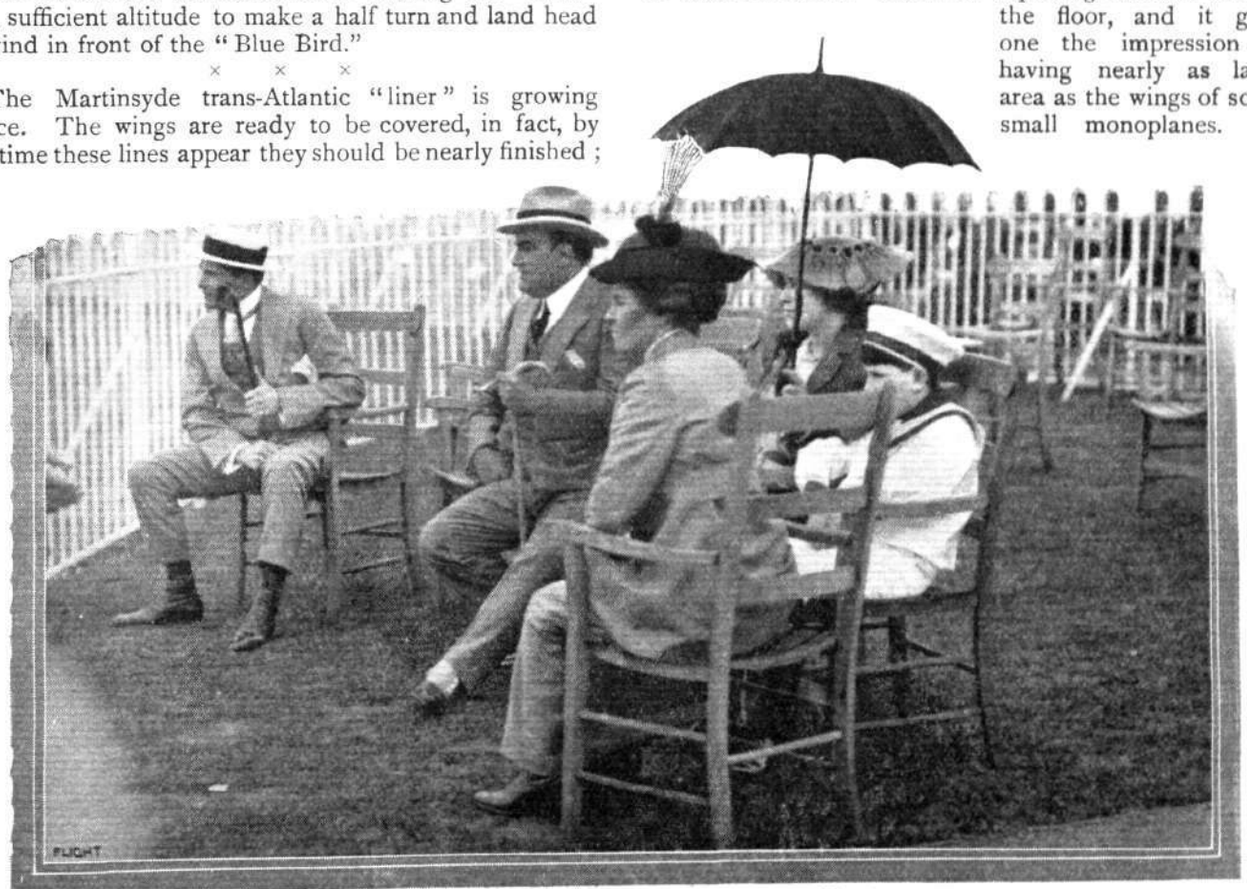
The Martinsyde trans-Atlantic "liner" is growing apace. The wings are ready to be covered, in fact, by the time these lines appear they should be nearly finished; and last week the *fuselage* was nearing completion. A faint idea of the size of the wings can be obtained from the accompanying photograph. Each wing is built up in two sections, of which the inner section is rigid whilst the outer one can be warped. The workmanship is, as one expects from a firm enjoying such a reputation as Messrs. Martin and Handasyde, of the very highest quality. In its general shape the *fuselage* resembles those of previous Martinsydes, but constructionally it differs in that cross-wiring is employed instead of the three-ply panels which have always formed one of the characteristics of these machines. I saw the *empennage* marked out on the floor, and it gave one the impression of having nearly as large area as the wings of some small monoplanes. In



Sig. Caruso is engrossed with the flying at Hendon.

addition to the two extra hangars which they have taken in view of all the parts being duplicated, the Martinsyde firm are building a large shed a short distance beyond the Blériot works in which to erect the new machine.

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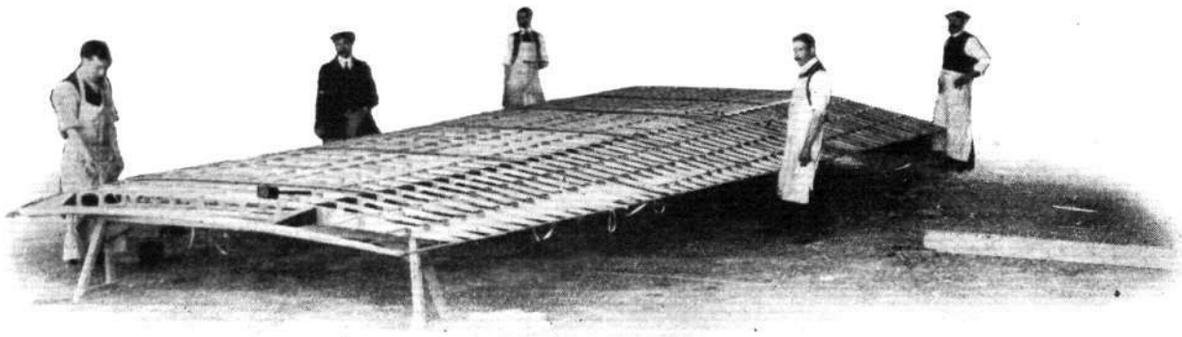
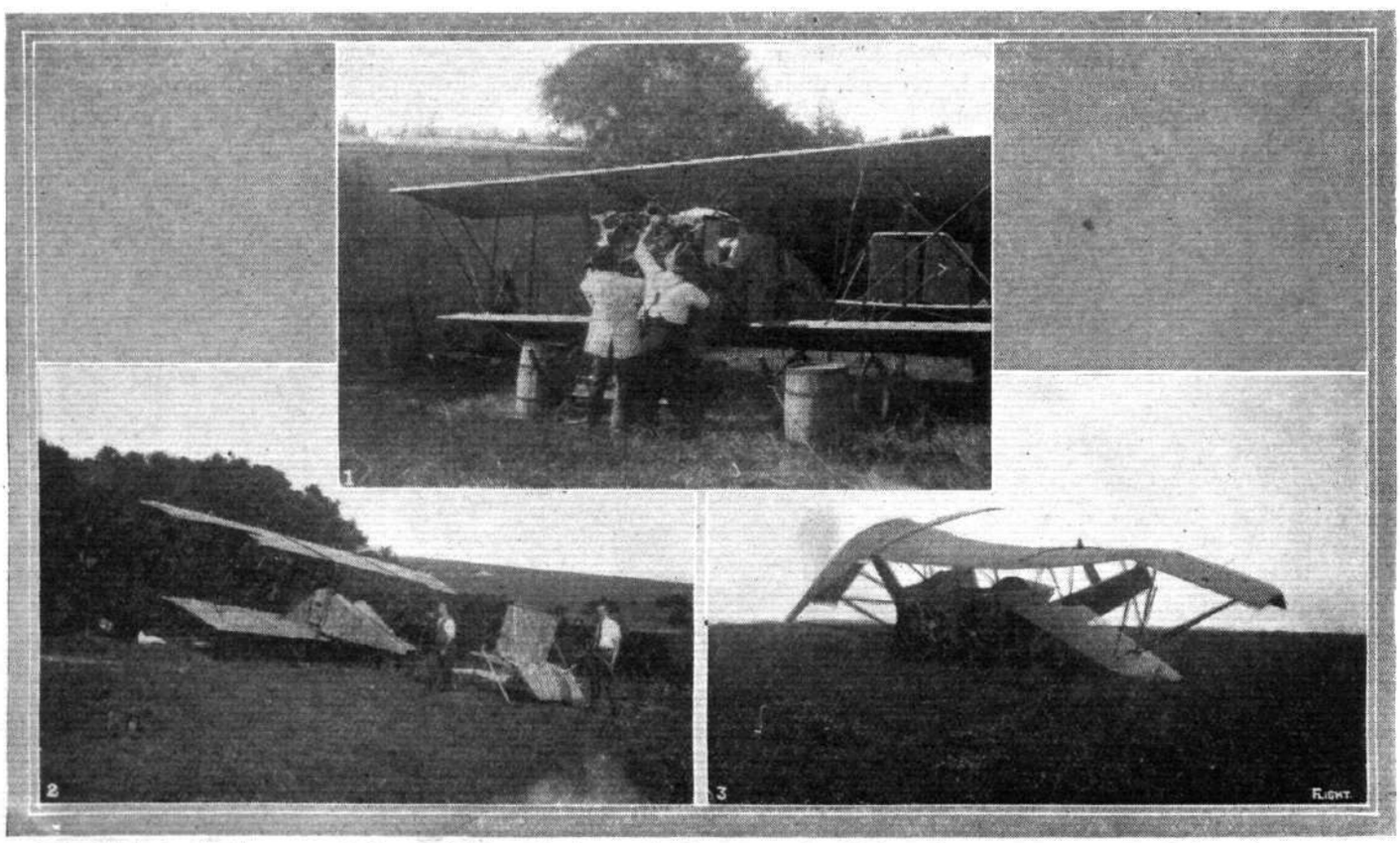
Building and flying an aeroplane out in South Africa is not exactly a Sunday school picnic, according to a letter I have received from Mr. A. K. Robertson, of Chiselhurst, Cambridge, Cape Province. Mr. Robertson's handiwork bears a slight resemblance to the Caudron biplane and took six months to build, only such materials as were unobtainable out there being imported. The work of construction was enlivened occasionally in the most unusual manners. Once, for instance, during a temporary suspension of operations, a family of rats was found comfortably installed in one of the extensions of the upper plane. On another occasion a swarm of bees took a fancy to the machine, much to the disgust of the erecters who did not relish the idea of working in a beehive, whilst it was an everyday occurrence for tarantulas to promenade up and down the ribs.

However, ultimately the machine was finished, and hauled down behind a motor car at night (to avoid the traffic) to the local racecourse. One fine morning, with a wind of only 10 m.p.h., the machine was tried, with the result shown in one of the accompanying photographs.



One of the wings "in the making" of the Martinsyde trans-Atlantic "liner."

Mr. Robertson, who had no previous experience in piloting an aeroplane, got into the seat, and a friend took hold of a wing tip while the engine was run throttled down. After deciding that everything was behaving "according to Cocker," Mr. Robertson nodded to his friend to let go, but the latter, not quite understanding the complexities of starting an aeroplane, "hung on like a true Briton," and did some giant leaps when the throttle was opened out. He was ultimately persuaded to let go, and after a run along the ground the machine was elevated a few feet and did a hop of about 400 yards. At this moment she was caught by a gust and rose to a height of about 50 ft.



Mr. Robertson's home-made South African biplane.—1. Mounting the 60 h.p. Anzani engine. 2. Before the smash, sheltering from the wind. 3. After the smash.

Before Mr. Robertson could get her nose down again she stalled and did a pancake from which there was no time to recover.

Mr. Robertson finishes his letter with the following brief but eloquent sentence : "I am rebuilding."

That's the right spirit. Stick to it, and better luck next time!

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I learn from Mr. F. Murphy, who is responsible for the design of the Hamble River seaplane, that the machine is now nearing completion after having been partly redesigned, and that it will be tested shortly. One wishes this newcomer to the aeroplane industry every success, as the machine embodied at the time of its appearance at the last Olympia Aero Show several innovations representing distinct advances in design and construction, although, as regards its general arrangement, following more or less standard lines.

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Mr. Dukinfield Jones, who, it will be remembered, did such good flying on the Isaacson-engined Flanders biplane, has now joined the D.F.W. firm and will in the future fly the well-known machines of that make. Mr. Jones already handles the big D.F.W., as if he had never piloted anything else, and he speaks very highly of this machine. One of the small fast 100 h.p. reconnaissance-type biplanes is expected over here shortly, so that Mr. Jones will then have a chance of showing what he can do on a really up-to-date fast machine.

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The Flanders biplane has, I understand, been bought by Mr. R. E. B. Hunt, who got his ticket at the Eastbourne Aviation Company's flying school in, if I am not mistaken, December last, and who is now making a tour in the Midlands. By the way, Mr. Howard Flanders is now on his way back from Australia, where he has been recuperating from his motor cycle accident some months since. Mr. Flanders' health has undergone a marked improvement during his stay in the southern hemisphere, and it is to be hoped that we may soon see him in harness again, for it would be a thousand pities should the aeroplane industry lose a man of such unquestionable ability as Mr. Flanders.

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Mr. J. L. Hall has discovered a new method of working his way, so to speak, from place to place. Like so many other great discoveries, it was made accidentally. It came about in this wise. Last Friday Mr. Hall set out for Brooklands with Miss Dulcebella Clifford, who is a pupil at the Hall flying school at Hendon, as a passenger on his Avro. The trip was made without incident, but as it was getting rather late Miss Clifford decided to take the train home. Mr. Hall had intended to spend the night at Brooklands, but as the telephone was found to be out of order he was unable to let his mechanics know of his decision to remain at Brooklands, and so to save them worry Mr. Hall decided to attempt the return journey. All went well until he ran into some dense clouds, then, as his compass was not reliable, he came down to a lower altitude to get his bearings, and incidentally noticed that according to his oil gauge there was precious little oil left, so little in fact that it would have been unwise to attempt to complete the journey. He therefore landed in the first likely-looking field.

Mr. Hall soon experienced that difficulty which has beset so many pilots who have had to make a forced

Commander Samson finds time at Hendon to appreciate the lighter side of things on *terra firma*.

landing *en route*. Within a couple of minutes his machine was surrounded by a crowd of people, who displayed a greater amount of interest than was altogether beneficial to the machine, sitting on the wings and trying to poke their fingers through the fabric. Several asked for passenger flights, and one or two managed to raise fifteen shillings each and were taken for short flights. Mr. Hall was rather pleased, as he had come away with a minus amount of cash about him, and the money thus raised paid for the two policemen who kept watch over the machine during the night, and also covered the bill respectfully tendered by the keeper of the inn in which Hall spent the night.

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FROM THE BRITISH FLYING GROUNDS.

Royal Aero Club Eastchurch Flying Grounds.

Naval Flying.—Monday last week, much too windy for flying, and only one machine was out, No. 150 Avro, 50 h.p.

Tuesday, rather windy, No. 104 Sopwith, 80 h.p.; No. 153 Bristol tractor, No. 49 B.E., No. 31 Henry Farman, 70 h.p.

Wednesday, windy. No 31 Henry Farman, 70 h.p., to Isle of Grain; No. 50 B.E.; No. 70 M. Farman, 70 h.p., from Isle of Grain.

Thursday, rather windy. No. 31 Henry Farman, 70 h.p., to Whitstable; No. 70 M. Farman, 70 h.p., only machines out.

Friday, fine. No. 70 Maurice Farman, 70 h.p., to Isle of Grain; No. 31 Henry Farman, 70 h.p.; No. 2 Short, 50 h.p.; No. 104 Sopwith, 80 h.p., Lieut. Marix, to Oxford; No. 49 B.E.; No. 45 Caudron, 50 h.p.; No. 64 Short, 50 h.p., to Whitstable.

Saturday, fine. No. 104 Sopwith from Oxford.

Civilian Flying.—Mr. Alec Ogilvie was out twice during the week on his 50 h.p. Wright. Mr. Leo Jezzi was out on Saturday evening, and had a short flight on his machine, 35 h.p. Little Jap, but had to give up as the engine was not working properly.

Brooklands Aerodrome.

Monday morning last week the Bristol and Vickers pupils out. Lieut. P. B. Joubert de la Ferté flew to Netheravon on Blériot 260. In the afternoon, Mr. Sippe on the Bristol "Scout," and Mr. Jack Alcock on the 100 Sunbeam.

On Tuesday morning, Mr. Alcock for three flights on the 100 Sunbeam; in the afternoon, Bristol biplanes out for cinematograph purposes, Mr. Waterfall on the Martinsyde, Mr. Mahl up to 5,000 ft. on the Sopwith. Arrival of No. 6 Sopwith "Scout."

Vickers and Bristol pupils out on Wednesday morning, and Mr. Gower on the 50 Blériot; in the afternoon, Mr. Sippe on the Bristol "Scout," Mr. Dukinfield Jones on the D.F.W., Mr. Gower two flights on Blériot, and Blériot, Bristol, and Vickers pupils out.

Bristol, Vickers and Blériot pupils out on Thursday, Mr. Dukinfield Jones on the D.F.W., and Mr. Waterfall on Martinsyde. Mr. L. Parker passed his *brevet* tests (altitude 400); in the afternoon, Mr. Strutt on Bristol, Mr. Waterfall on Martinsyde, Mr. Dukinfield Jones for three flights on D.F.W., Mr. Alcock on 100 Sunbeam, Mr. Gower on 50 Blériot, and Blériot, Vickers, and Bristol pupils out.

On Friday, Bristol, Blériot, and Vickers pupils out, Mr. Gower on 50 Blériot, Mr. Sippe on Bristol "Scout" and Mr. Dukinfield Jones on D.F.W.; in the afternoon, Mr Waterfall on Martinsyde, afterwards taking up Lieut. Blatherwick, R.N., as passenger, and then off to Farnborough for test; Mr. Gower on 50 Blériot, Mr. Sippe on Bristol "Scout," engine test of Vickers "Scout," Mr. Sippe on Bristol "Scout" for cinematograph, Mr. Alcock to Sunbury on 100 Sunbeam, Mr. J. L. Hall and lady passenger came in from Hendon on 50 Avro. Mr. Mahl on Sopwith. Bristol, Blériot and Vickers pupils out. *Brevets*: Mr. Racine Jacques on Bristol (altitude 350) and Mr. Jack Collins, A.B. (altitude 550).

Brevet tests by Mr. T. S. Duncan on Vickers biplane (altitude 600) on Saturday morning. Mr. Alcock on 100 Sunbeam, Mr. Waterfall arrived back from Farnborough on Martinsyde with Mr. Claude Joubert de la Ferté as passenger. In the afternoon, Mr. Alcock to Sunbury on 100 Sunbeam, Mr. Mahl on Sopwith two-seater and "Scout," Mr. Gower on 50 Blériot, Mr. Dukinfield Jones on D.F.W., Lieut. Collett, R.N., on D.F.W., Mr. Sippe with Mr. Stutt in from Farnborough on 80 Bristol tractor in 19 mins., Mr. Stutt on 50 Bristol, Mr. Sippe on Bristol "Scout."

On Sunday, Mr. Mahl was first out on Sopwith two-seater, followed by Mr. Alcock on the 100 Sunbeam, and Mr. Gower on the 50 Blériot. The winner of the free passenger flight—Miss Kitty Allen—was taken across country by Mr. Alcock on the 100 Sunbeam.

On Whit-Monday there was plenty of interesting flying during the course of the motor racing, by Messrs. Mahl (Sopwith), Pixton (Sopwith "Scout"), Dukinfield Jones (D.F.W.), Alcock (100 Sunbeam), and Gower (Blériot). Seven of the ten entrants started in the Whitsun Aeroplane Handicap, which was won by Mr. Knight on the 50 Vickers, followed by Mr. Stutt on the 50 Bristol, Mr. Waterfall on the Martinsyde, Mr. Sopwith on the Sopwith "Scout," Mr. Sippe on the Bristol "Scout," Mr. Mahl on the 80 Sopwith two-seater, and Mr. Alcock on the 100 Sunbeam. Mr. Knight, who was on limit with Mr. Stutt, took the lead at the start, and the back division were unable to overhaul him. The struggle between the two machines of the "Scout" type was particularly interesting.

Vickers School.—Monday last week, Lieut. Gillman on biplane with instructor.

Wednesday. With pilot:—Lieuts. Eberli and Gillman, and Messrs. Collins, Parker and Steinbach. Messrs. Collins, Steinbach and Wilson solos. Messrs. Miller and Klingenstein with pilot.

Thursday. With pilot:—Lieut. Eberli and Messrs. Klingenstein and Miller, and Lieut. Tennant. Messrs. Wilson, Collins and Steinbach, and Lieut. Tennant solos.

Friday. With pilot:—Lieuts. Tennant and Eberli, and Messrs. Klingenstein and Miller. Messrs. Steinbach, Collins and Wilson, and Lieuts. Tennant and Eberli solos. Mr. Collins for *brevet*, getting through in fine style.

London Aerodrome, Collindale Avenue, Hendon.

Grahame-White School.—Thursday last week, Messrs. Lui, Shepherd, Wyles, Boyesen, Robinson, Lowe, and Major Peck straights with Instructors Birchenough, Howarth, and Barrs. Mr. Howett solo straights and right-hand turns. Messrs. Carpenter, Cowley, and Weber solo circuits.

Friday, Messrs. Weber, Carpenter, Cowley, Howet, solo circuits, figures of eight, &c., Messrs. Winter, Robinson, Boyesen, solo straights and circuits. Messrs. Lui, Palmer, Shepherd, Wyles, Lowe, and Major Peck, straights with Instructors Howarth and Lillywhite. Mr. Gruning rolling and afterwards making straights with Instructors. Mr. Carpenter later completing his *brevet* tests.

Saturday, Messrs. Shepherd, Lui, Wyles, and Major Peck, straights with Instructor Barrs. Messrs. Cowley, Weber, solo circuits, figures of eight, &c., Mr. Boyesen, solo circuits.

Beatty School.—Pupils during last week, with Instructor M. Baumann on machine. Wright 50 h.p. gyro biplane. Messrs. Bentley, 21 mins.; Elverson, 10; Allen, 25; Banks-Price, 20; Ruffy, 25; Maclachlan, 18; Boyesen, 14; Cheung, 7; Dr. Roe, 15; Lieut. Macguire, 6; Capt. Bass, 35. Doing circuits alone: Messrs. Watts, 18; Stewart, 15.

British Caudron School.—Monday last week, too windy for school to go out. Tuesday and Wednesday, the same. Thursday, school out at 4.30 a.m. under the instruction of W. T. Warren and R. Desoutter. W. T. Warren test flight. Mr. Macgregor doing circuits and figures of eight in good style. Rene Desoutter flight. At 5 o'clock, Friday, school was out, under the instruction of W. T. Warren and R. Desoutter. Mr. Macgregor doing his two sets of figures of eight for his *brevet*. Saturday, school out at 5 o'clock. W. T. Warren and Rene Desoutter flights.

Hall School.—Instructors for week: T. Clappen and C. Virgilio. Sunday last week, J. L. Hall on Avro, two flights, quarter of an hour at 2,000 ft. Later took M. Henri Lonchamp and Miss Hanson passenger flights. Monday and Tuesday, very windy. Wednesday, J. L. Hall on Avro at 3,000 ft. Thursday, Henry Gearing six good straight flights. A. F. Arcies seven very good flights at 60 ft. At 5 a.m., Friday, Henry Gearing six well-judged straights at 15 ft. J. Rose four straights and one short flight on No. 1 Caudron. In evening, A. F. Arcies made three excellent circuits at 300 ft. with well-banked turns, landing with a well-judged *vol plané*. H. Gearing now ready for circuits. J. L. Hall, out in afternoon, flew over to Ealing on Avro. In evening J. L. Hall, accompanied by Miss D. Clifford (pupil), mounted to 4,000 ft., and flew over to Brooklands. As dusk approached, J. L. Hall started off alone from Brooklands, but got caught in heavy rainstorm, and running short of castor oil had to make a landing in a hayfield near Southall. Saturday, in early morning, J. L. Hall continued his flight from Southall, and arrived safely at Hendon. After breakfast several passengers were taken aloft in the Avro. Mr. Gearing, sen. (father of pupil), who scales at 16 st., was taken up to 1,000 ft.

The Aerial Derby round London, which was to have taken place on Saturday, May 23rd, but which was postponed on account of bad weather, will be flown to-morrow (Saturday). Those who saw the performances of the Sopwith and Avro scouts at Hendon on May 23rd will have an idea of the speeds to be expected in the race. In addition to these machines, there are entered two other fast scouting biplanes—the Bristol and the Vickers scouts—which are expected to be as fast, if not faster, than the Sopwith "tabloid," whilst the four Morane monoplanes entered will be well matched, being all of the same engine power.

"ÆOLUS."

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The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

Diary of Events.

June 6	...	Aerial Derby. Hendon Aerodrome.
June 10	...	Balloon Race. Hurlingham Club, Fulham, S.W.
June 27	...	Balloon Race. Hurlingham Club, Fulham, S.W.
July 11	...	International Correspondence Schools Race, London–Paris–London. Hendon Aerodrome.
July 11	...	Balloon Race. Hurlingham Club, Fulham, S.W.
Aug. 1–15		*Daily Mail* £5,000 Circuit of Britain Race. Starting from Southampton Water.
Aug. 22–29		Gordon-Bennett Eliminating Trials. Salisbury Plain.
Sept. 19–28		Gordon-Bennett Aviation Race. Buc, France.

AERIAL DERBY, HENDON AERODROME.

To-morrow, Saturday, starting at 4.15 p.m.

Members of the Royal Aero Club will be admitted free to the Hendon Aerodrome on presentation of their Club Membership Cards. The Membership Card admits the Member only—motor cars must be paid for.

Balloon Race at Hurlingham.

Wednesday, June 10th, 1914, at 3 p.m.

A Hare and Hounds Balloon Race for a Cup presented by Mr. John Dunville will start from the Hurlingham Club, Fulham, S.W., on Wednesday next, the 10th inst., at 3 p.m. Mr. John Dunville will pilot the "Hare" Balloon, and competitors will follow at short intervals. The competitor who lands nearest the "Hare" Balloon will be the winner. The following entries have so far been received :—

Mr. John Dunville	...	Balloon "Banshee II"
Major The Hon. Claud Brabazon	..	Balloon "Zeta"
Lieut. T. G. Hetherington ...	...	Balloon "Dunlop"
Lieut.-Col. E. M. Maitland...	...	Balloon "R.F.C."
Mr. A. Mortimer Singer ...	...	Balloon "Planet"
Mr. Lionel H. Mander ...	...	Balloon "Meteor"
Capt. Lionel L. Atherton ...	...	Balloon "Thistledown"

Members will be admitted free to the Hurlingham Club on presentation of their Club Membership Cards.

Daily Mail £5,000 Circuit of Britain Race.

The following entries have been received :—

Messrs. White and Thompson—
1. Curtiss Biplane. Two 100 h.p. Curtiss engines. Pilot: Mr. A. Loftus Bryan.
2. Curtiss Biplane. 125 h.p. Anzani engine. Pilot: Capt. Ernest C. Bass.

Sopwith Aviation Co., Ltd.—
1. Sopwith Biplane. 150 h.p. Sunbeam engine. Pilot: Mr. C. Howard Pixton.
2. Sopwith Biplane. 100 h.p. English *monosoupape* Gnome engine. Pilot: Mr. H. G. Hawker.

Grahame-White Aviation Co., Ltd.—
Grahame-White Biplane. 100 h.p. English *monosoupape* Gnome engine. Pilot: Probably Mr. C. Grahame-White.

Messrs. A. V. Roe and Co., Ltd.—
Roe Biplane. 150 h.p. Sunbeam engine. Pilot: Mr. F. P. Raynham.

Eastbourne Aviation Co., Ltd.—
Tractor Biplane. 120 h.p. Green engine. Pilot: Mr. F. B. Fowler.

Blackburn Aeroplane Co., Ltd.—
Blackburn Hydro-Biplane. 130 h.p. Salmson engine. Pilot: Mr. Sydney Pickles.

Late entries will be received up to 12 noon, June 30th, 1914, in which case the Entrance Fee will be £150.

Rule 4, "Qualification of Aircraft," has been revised and now reads as follows :—

The complete aircraft and all its parts, including the motor, must have been entirely constructed within the confines of the British Empire, but this provision shall not be held to apply to raw material, *or the magneto*.

WORLD'S AVIATION RECORDS TO MAY 6th, 1914, PASSED BY THE FÉDÉRATION AÉRONAUTIQUE INTERNATIONALE.

ISSUED BY THE ROYAL AERO CLUB.

AVIATION.

SPEED. Closed Circuit without Alighting.

Distance.	Aviator.	Country Holding Record.	Date of Record.	Time.
kiloms.		*Aviator only.*		h. m. s.
5	J. Vedrines	United States	Sept. 9, 1912	0 1 43⅘
10	M. Prevost	France ...	,, 29, 1913	0 2 56⅗
20	M. Prevost	,, ...	,, 29, 1913	0 5 54⅕
30	M. Prevost	,, ...	,, 29, 1913	0 8 52⅗
40	M. Prevost	,, ...	,, 29, 1913	0 11 50⅘
50	M. Prevost	,, ...	,, 29, 1913	0 14 48⅗
100	M. Prevost	,, ...	,, 29, 1913	0 29 40
150	M. Prevost	,, ...	,, 29, 1913	0 44 38
200	M. Prevost	,, ...	,, 29, 1913	0 59 45⅗
250	J. Vedrines	,, ...	Jan. 9, 1913	2 1 53⅗
300	Gobioni ..	Italy	Mar. 28, 1912	2 49 0
350	Gilbert ...	France ...	Dec. 30, 1912	3 26 16
400	Gilbert ...	,, ...	,, 30, 1912	3 55 27⅘
450	Gilbert ...	,, ...	,, 30, 1912	4 24 44⅕
500	Gilbert ...	,, ...	,, 30, 1912	4 54 6⅘
600	Gilbert ...	,, ...	,, 30, 1912	5 52 38
700	Fourny ...	,, ...	Sept. 11, 1912	9 31 1
800	Fourny ...	,, ...	,, 11, 1912	10 44 45⅕
900	Fourny ...	,, ...	,, 11, 1912	11 59 9⅘
1,000	Fourny ...	,, ...	,, 11, 1912	13 1 12
kiloms.		*Aviator and One Passenger.*		h. m. s.
5	H. Bier ...	Austria ...	Oct. 1, 1912	0 2 58
10	G. Legagneux	France ...	July 20, 1912	0 4 24⅕
20	G. Legagneux	,, ...	,, 20, 1912	0 8 51
30	G. Legagneux	,, ...	,, 20, 1912	0 13 18⅘
40	G. Legagneux	,, ...	,, 20, 1912	0 17 44⅕
50	G. Legagneux	,, ...	,, 20, 1912	0 23 13
200	H. Bier ...	Austria ...	Oct. 1, 1912	2 3 49
250	E. Guillaux...	France ...	Feb. 11, 1913	2 34 48⅘
300	E. Guillaux...	,, ...	,, 11, 1913	3 4 50
350	E. Guillaux...	France ...	Feb. 11, 1913	3 34 46⅘
400	E. Guillaux...	,, ...	,, 11, 1913	4 4 42⅘
kiloms.		*Aviator and Two Passengers.*		h. m. s.
5	Ch. Nieuport	Austria ...	June 30, 1912	0 2 52
10	Ch. Nieuport	,, ...	,, 30, 1912	0 5 45
20	Ed. Nieuport	France ...	Mar. 9, 1911	0 11 59⅘
30	Ed. Nieuport	,, ...	,, 9, 1911	0 17 52⅘
40	Ed. Nieuport	,, ...	,, 9, 1911	0 22 44⅘
50	Ed. Nieuport	,, ...	,, 9, 1911	0 29 37⅘
100	Ed. Nieuport	,, ..	,, 9, 1911	0 59 8
kiloms.		*Aviator and Three Passengers.*		h. m. s.
5	P. Mendelli	Austria ...	Aug. 16, 1912	0 3 48
10	G. Busson .	France ...	Mar. 10, 1911	0 6 16⅗
20	P. Mendelli	Austria ...	Aug. 16, 1912	0 12 3
30	P. Mendelli	,, ...	,, 16, 1912	0 17 37
40	P. Mendelli	,, ...	,, 16, 1912	0 23 11
50	P. Mendelli	,, ...	,, 16, 1912	0 29 47
100	P. Mendelli	,, ...	,, 16, 1912	0 56 33
kiloms.		*Aviator and Four Passengers.*		h. m. s.
5	G. Busson ...	France ...	Mar. 10, 1911	0 3 34
10	G. Busson ...	,, ...	,, 10, 1911	0 7 8
20	G. Busson ...	,, ...	,, 10, 1911	0 14 0⅖
30	Champel ...	,, ...	April 15, 1913	0 21 53⅕
40	Champel ...	,, ...	,, 15, 1913	0 29 13⅘
50	Champel ...	,, ...	,, 15, 1913	0 37 31
100	Champel ...	,, ...	,, 15, 1913	1 13 1⅕
150	Champel ...	,, ...	,, 15, 1913	1 49 11⅕
200	Champel ...	,, ...	,, 15, 1913	2 25 2⅕
250	Champel ...	,, ...	,, 15, 1913	3 1 17
kiloms.		*Aviator ana Six Passengers.*		h. m. s.
10	Garaix ...	France ...	April 22, 1914	0 5 35
20	Garaix ...	,, ...	,, 22, 1914	0 11 12⅕
30	Garaix ...	,, ...	,, 22, 1914	0 16 48⅘
40	Garaix ...	,, ...	,, 22, 1914	0 22 28⅕
50	Garaix ...	,, ...	,, 22, 1914	0 28 5⅘
100	Garaix ...	,, ...	,, 22, 1914	0 56 44

GREATEST SPEED. Closed Circuit without Alighting.

Aviator.	Country Holding Record.	Date of Record.	Speed per Hour in a Flight of 5 Kiloms.
	Aviator only.		
M. Prevost	France	Sept. 29, 1913	203·850 kiloms.
	Aviator and One Passenger.		
G. Legagneux	France	July 20, 1912	135·952 kiloms.
	Aviator and Two Passengers.		
E. Nieuport	France	July 20, 1912	102·855 kiloms.
	Aviator and Three Passengers.		
P. Mendelli	Austria	Aug. 16, 1912	106·029 kiloms.
	Aviator and Four Passengers.		
G. Busson	France	Mar. 10, 1911	87·251 kiloms.
	Aviator and Six Passengers.		
Garaix	France	April 22, 1914	107·642 kiloms.

DISTANCE. Closed Circuit without Alighting.

Aviator.	Country Holding Record.	Date of Record.	Distance Covered.
	Aviator only.		
A. Seguin	France	Oct. 13, 1913	1,021·200 kils.
	Aviator and One Passenger.		
E. Guillaux	France	Feb. 11, 1913	410 kiloms.
	Aviator and Two Passengers.		
H. Bier	Austria	Oct. 1, 1911	112 kiloms.
	Aviator and Three Passengers.		
Mendelli	Austria	Aug. 16, 1912	110 kiloms.
	Aviator and Four Passengers.		
Champel	France	April 15, 1913	250 kiloms.
	Aviator and Six Passengers.		
Garaix	France	April 22, 1914	110 kiloms.

DISTANCE. In a Straight Line without Alighting.

	Aviator and One Passenger.		
Deroye	Italy	July 17, 1913	784 kiloms.

TIME. Closed Circuit without Alighting.

Time.	Aviator.	Country Holding Record.	Date of Record.	Distance.
hours.	*Aviator only.*			kiloms.
¼	M. Prevost	France	Sept. 29, 1913	50
½	M. Prevost	,,	,, 29, 1913	100
1	M. Prevost	,,	,, 29, 1913	200
2	J. Vedrines	,,	Jan. 9, 1913	246·937
3	M. Tabuteau	,,	,, 24, 1912	310·281
4	Gilbert	,,	Dec. 30, 1912	401·900
5	Gilbert	,,	,, 30, 1912	510
6	Bournique	,,	,, 31, 1910	490
7	M. Tabuteau	,,	,, 30, 1910	522·935
8	Fourny	,,	Sept. 11, 1912	585·200
9	Fourny	,,	,, 11, 1912	661·200
10	Fourny	,,	,, 11, 1912	744·800
11	Fourny	,,	,, 11, 1912	820·800
12	Fourny	,,	,, 11, 1912	904·400
13	Fourny	,,	,, 11, 1912	980·400
hours.	*Aviator and One Passenger.*			kiloms.
¼	G. Legagneux	France	July 5, 1912	31·020
½	G. Legagneux	,,	,, 5, 1912	66·639
1	G. Legagneux	,,	,, 5, 1912	133·469
2	E. Guillaux	,,	Feb. 11, 1913	191·900
3	E. Guillaux	,,	,, 11, 1913	291·900
4	E. Guillaux	,,	,, 11, 1913	391·900
hour.	*Aviator and Three Passengers.*			kiloms.
1	P. Mendelli	Austria	Aug. 16, 1912	106·029
hours.	*Aviator and Four Passengers.*			kiloms.
¼	Champel	France	April 15, 1913	20
½	Champel	,,	,, 15, 1913	40
1	Champel	,,	,, 15, 1913	82·343
2	Champel	,,	,, 15, 1913	164
3	Champel	,,	,, 15, 1913	247·303
hour.	*Aviator and Six Passengers.*			kiloms.
¼	Garaix	France	April 22, 1914	20
½	Garaix	,,	,, 22, 1914	50
1	Garaix	,,	,, 22, 1914	104·141

DURATION. Closed Circuit without Alighting.

Aviator.	Country Holding Record.	Date of Record.	Time.
	Aviator only.		
Langer	Germany	Feb. 3, 1914	14 h. 7 m.
	Aviator and One Passenger.		
Gaubert	France	Aug. 30, 1913	6 h. 42 m. 49⅗ s.
	Aviator and Two Passengers.		
Shirrmeister	Germany	Nov. 12, 1913	6 h. 16 m. 30 s.
	Aviator and Three Passengers.		
Gaell	Germany	Sept. 2, 1913	3 h. 11 m. 14 s.
	Aviator and Four Passengers.		
Champel	France	April 15, 1913	3 h. 1 m. 17 s.
	Aviator and Five Passengers.		
Faller	Germany	Jan. 9, 1913	1 h. 10 m. 17 s.
	Aviator and Six Passengers.		
Garaix	France	April 22, 1914	1 h. 2 m. 25⅗ s.
	Aviator and Seven Passengers.		
L. Noel	Great Britain	Sept. 22, 1913	17 m. 25⅘ s.
	Aviator and Eight Passengers.		
Frantz	France	Mar. 2, 1913	11 m. 28⅖ s.
	Aviator and Nine Passengers.		
L. Noel	Great Britain	Oct. 2, 1913	19 m. 47 s.

ALTITUDE.

Aviator.	Country Holding Record.	Date of Record.	Altitude.
	Aviator only.		
G. Legagneux	France	Dec. 28, 1913	6,120 metres.
	Aviator and One Passenger.		
Linnekogel	Germany	Mar. 24, 1914	5,500 metres.
	Aviator and Two Passengers.		
Oblt. von Blaschke	Austria	June 29, 1912	3,580 metres.
	Aviator and Three Passengers.		
Thelen	Germany	Mar. 20, 1914	3,700 metres.
	Aviator and Four Passengers.		
Garaix	France	Feb. 25, 1914	3,050 metres.
	Aviator and Five Passengers.		
Garaix	France	Feb. 4, 1914	2,230 metres.
	Aviator and Six Passengers.		
Garaix	France	Jan. 31, 1914	1,750 metres.
	Aviator and Seven Passengers.		
Garaix	France	Mar. 17, 1914	1,600 metres.
	Aviator and Eight Passengers.		
Garaix	France	Mar. 28, 1914	1,530 metres.
	Aviator and Nine Passengers.		
Garaix	France	Mar. 30, 1914	1,590 metres.
	Aviator and Fifteen Passengers.		
Sykorsky	Russia	April 25, 1914	300 metres.

BALLOONS.

DISTANCE.

Holder of Record.	Voyage Effected.	Country Holding Record.	Date of Record.	Distance.
Hugo Kaulen ...	Bitterfeld (Germany)–St. Petersburg–Perm (Siberia, Russia)	Germany	Dec. 13–17th, 1913	kiloms. 2,827·900

DURATION.

Holder of Record.	Voyage Effected.	Country Holding Record.	Date of Record.	Time.
Hugo Kaulen	Bitterfeld (Germany)–St. Petersburg–Perm (Siberia, Russia)	Germany	Dec. 13–17th, 1913	87 hours

ALTITUDE.

Holder of Record.	Voyage Effected.	Country Holding Record.	Date of Record.	Altitude.
Suring and Berson	From Berlin	Germany	June 31st, 1901	10,800 m.

DIRIGIBLES.

DISTANCE.

Dirigible	Voyage Effected.	Country Holding Record.	Date of Record.	Distance.
P. 5 ...	Verona – Sanguinetto – Modena – Casena – Ancona – Venice – Monte-Belluna – Vicenza–Verona	Italy ...	July 30th, 1913	kiloms. 810

DURATION.

				Time.
P. 5 ...	Verona – Cremona – Pavia – Turin – Chivasso – Mortara – Milan–Brescia–Verona	Italy ...	June 25th, 1913	15 hours.

ALTITUDE.

				Altitude. metres.
Comté ...	Issy-les-Moulineaux ...	France	June 18th, 1912	3,080

SPEED.

				Speed per hour. kiloms.
P. 5 ...	Verona – Sanguinetto–Modena–Casena–Ancona–Venice–Monte-Belluna–Vicenza–Verona	Italy ...	July 30th, 1913	64·800

166, Piccadilly, W. HAROLD E. PERRIN, Secretary.

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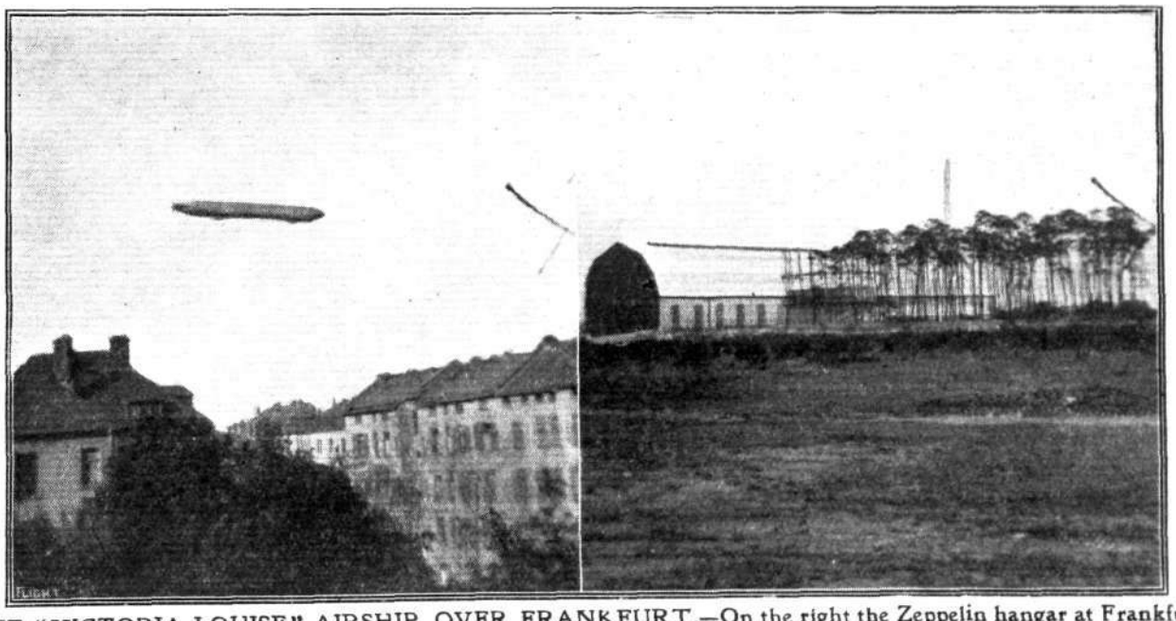
The *Daily Mail* Circuit of Britain.

WHEN the entries for the *Daily Mail* Circuit of Britain closed at ordinary fees on Saturday last they numbered eight. The entries close finally on June 30th. At present they include two Curtiss machines, entered by Messrs. White and Thompson, one to be piloted by Mr. Loftus Bryan, fitted with two 100 h.p. Curtiss engines; while the other, to be flown by Capt. Bass, will have a 125 h.p. Anzani engine; two Sopwith biplanes, one with 150 h.p. Sunbeam engine, which C. H. Pixton will pilot, and the other, with a 100 h.p. British-Gnome motor, of which Hawker will be in charge; a Grahame-White biplane, with 100 h.p. British-Gnome motor, which Mr. Claude Grahame-White may pilot; an Avro with 150 h.p. Sunbeam engine, with Mr. E. P. Raynham as pilot; an E.A.C. biplane, with 120 h.p. Green engine, which Mr. F. B. Fowler will pilot, while the eighth is a Blackburn monoplane, with 130 h.p. Salmson, which Mr. Sydney Pickles is to pilot.

Testing the Langley Machine.

READERS of FLIGHT will recall that at the beginning of this year it was stated that the Smithsonian Institution, the great national museum of the U.S.A., announced that while it could not allow the original Langley machine to be taken from its place in order to be tested, they would willingly allow anyone every facility to obtain dimensions in order to build an exact duplicate. A cable message from New York states that the flying capabilities of the machine designed by Langley were demonstrated on Friday last week by Glenn Curtiss in a short flight over the lake at Hammondsport, New York. Instead of the catapult launching device used by Langley, however, the machine was fitted with floats and rose from the water. This test has a purpose in view, besides vindicating Langley. It is held that by this proof of the capability of the Langley machine to fly, certain patent claims can be successfully overcome.



THE "VICTORIA LOUISE" AIRSHIP OVER FRANKFURT.—On the right the Zeppelin hangar at Frankfurt. These photographs reach us from Mr. L. F. Hutcheon, who writes as follows: "These prints are from negatives taken by myself at Frankfurt-am-Maine this year. The 'Victoria Louise' (owned by the town of Frankfurt) was taken from my bedroom at six o'clock in the evening when it was cruising over Frankfurt. On cruises such as this only the forward propellers and the engines in the first gondola are used. Passenger flights cost 200 marks (about £10

THE PRINCE HENRY CIRCUIT, 1914.

THIS year's Prince Henry Circuit, which took place from May 17th to 25th, was one of the greatest events of its kind ever held in Germany, no fewer than 40 machines taking part in the circuit. Half of these were military machines piloted by military aviators, whilst the other half were entered by civilian firms and flown by civilian aviators. The rules of the race stipulated that the owner of the machines as well as the pilot had to be subjects of the German Empire. Each pilot had to carry a passenger, who, in view of the

THE PRINCE HENRY CIRCUIT.—On the left, v. Thüna, the winner of the Kaiserprize, with Lieut. v. Kleist, his observer, and their 100 h.p. Mercedes biplane. On the right (from right to left), Prince Henry of Prussia, Messrs. Trutz, Geheimer Rat Büxenstein, Winter (K.F.A.C.). (From the *Allgemeine Automobil Zeitung.*)

Particulars of Machines and Pilots entered for the Prince Henry Circuit.

Start No.	Pilot.	Observer.	Type of machine.	Speed.	Span.	Length.	Area.	Weight, empty.	Engine.	h.p.
			Army Machines.							
				m.p.h.	ft.	ft.	sq. ft.	lbs.		
1	Lieut. Canter	Lieut. Böhmer	Rumpler Taube	74	46	27	300	1320	Mercedes	100
2	Capt. v. Detten	Capt. v. Falkenhayn	Albatros Taube	64	50	34	380	1320	,,	,,
3	Lieut. Hantelmann	Lieut. Zimmer-Vorhaus	,,	64	50	34	380	1320	,,	,,
4	Lieut. Joly	Lieut. Felmy	Gotha Taube	74	46	28	300	—	,,	,,
5	Lieut. Kastner	Lieut. Niemöller	Albatros Taube	64	50	34	380	1320	,,	,,
6	Lieut. Kolbe	Lieut. Rohde	,,	64	50	34	380	1320	,,	,,
7	Lieut. Ladewig	Lieut. Trenkmann	Rumpler Taube	74	46	27	300	1320	,,	,,
8	Lieut. Pfeifer	Lieut. v. d. Hagen	Albatros Taube	64	50	34	380	1320	,,	,,
9	Lieut. Pretzell	Lieut. Wencker	,,	64	50	34	380	1320	,,	,,
10	Lieut. v. Beaulieu	Capt. Geerdtz	L.V.G. biplane	65	50	31	480	1670	,,	,,
11	Lieut. Bonde	Lieut. Müller	Albatros biplane	74	42	26	390	1270	,,	,,
12	Lieut. v. Buttlar	Lieut. v. Schröder	L.V.G. biplane	65	50	31	480	1670	,,	,,
13	Lieut. Carganico	Lieut. Friedberg	,,	65	50	31	480	1670	,,	,,
14	Lieut. Emrich	Lieut. Leonhardt	Otto biplane	62	50	—	440	—	,,	,,
15	Lieut. Geyer	Lieut. Kühn	Aviatik biplane	—	46	26	490	1470	,,	,,
16	Lieut. v. Hiddessen	Lieut. Müller	Albatros biplane	74	42	26	390	1270	,,	,,
17	Lieut. Schlemmer	Lieut. König	L.V.G. biplane	65	50	31	480	1670	,,	,,
18	Lieut. v. Thüna	Lieut. v. Kleist	,,	65	50	31	480	1670	,,	,,
19	Lieut. Walz	Lieut. Müller	,,	65	50	31	480	1670	,,	,,
20	Lieut. Wentscher	Lieut. v. Falckenstein	,,	65	50	31	480	1670	,,	,,
			Civilian Machines.							
21	Anslinger	Lieut. Zeumer	Goedecker monoplane	60	46	36	400	1100	Mercedes	100
22	Lieut v. Armin	Lieut. Kuntz	Arnim monoplane	—	—	—	—	—	Argus	120
23	Beck	Lieut. Schletter	Kondor monoplane	—	—	—	—	—	Mercedes	100
24	Freindt	Capt. Hellmich	Jeannin Steel Taube	75	42	30	230	1320	Argus	120
25	Friedrich	Lieut. Peters	Rumpler monoplane	72	46	27	308	1320	Mercedes	100
26	Höfig	—	D.F.W. monoplane	—	—	—	—	—	,,	,,
27	Krumsiek	Lieut. Plagemann	Hansa Taube	72	46	28	308	—	,,	,,
29	Schlegel	Lieut. Spang	Gotha Taube	72	46	28	308	—	,,	,,
30	Lieut. Steffens	Lieut. v. Weyhe	Etrich Taube	—	—	—	—	—	,,	,,
32	Hennig	Lieut. Deichmann	Schwade biplane	60	60	—	506	1012	Stahlhertz	80
33	Laitsch	Lieut. Koch	L.V.G. biplane	65	48	31	484	1670	Mercedes	100
34	Schauenburg	Lieut. Hug	A.E.G. biplane	70	48	32	440	1540	Benz	110
35	Schüler	—	Ago biplane	—	—	—	—	—	Argus	140
37	Sommer	—	Sommer biplane	—	—	—	—	—	Gnome	80
38	Stoeffler	Lieut. Krause d'Avis	Aviatik biplane	—	35	24	393	900	Oberursel	114
39	Thelen	Capt. Gheibel	Albatros biplane	70	42	26	396	1270	Mercedes	75
40	Weyl	Lieut. Sendel	Otto biplane	60	49	—	440	—	Argus	140
			Competing Unofficially.							
28	Paschen	Lieut. Creydt	Halberstadt Taube	92	48	30	340	1496	Mercedes	100
31	Stiefvater	Lieut. Zimmermann	Prince Sigismund Taube	—	—	—	—	—	Argus	120
36	Schröder	Schäfer	Sommer biplane	—	33	26	350	—	Gnome	100
40*a*	Lieut. Surèn	Lieut. v. Ascheberg	Gotha biplane	—	—	—	—	—	Oberursel	100
40*b*	Mühlig-Hofmann	Lieut. Suchland	Albatros biplane	70	42	26	396	1275	Mercedes	100

fact that the race included flying over fortresses, had to be an officer of the German Army or Navy. All the machines had to be German built, whilst the engines might be of any origin. Machines not owned by the Government had to pass the following tests before entering: (1) Climb to an altitude of 800 metres in not more than 15 mins., with a useful load of 200 kilogs., including pilot and passenger and sufficient fuel for a flight of 4 hrs. duration. (2) Rise after a run not exceeding 100 metres and alight after a run not exceeding 70 metres with the load mentioned above.

The circuit was divided in the following manner: *A. First part of reliability trials*, in two stages. First stage: Start from Darmstadt, fly over controls at Mannheim, Pforzheim, Speyer, Mannheim, Worms, and land at Frankfurt-a.-M. (400 kiloms.). Duration of stop at Frankfurt is optional. Second stage: Start from Frankfurt-a.-M., fly over controls at Wiesbaden, Coblenz, Cologne, and land at Frankfurt-a.-M. (375 kiloms.).

B. Second part of reliability trials in two stages. Third stage: Start from Frankfurt-a.-M., fly over controls at Marburg, Cassel, Braunschweig, and land at Hamburg (440 kiloms.). Duration of stop at Hamburg optional. Fourth stage: Start from Hamburg, fly over controls at Hanover, Minden, Herford, Münster, Osnabrück, Bremen, and land at Hamburg (565 kiloms.).

C. Strategical reconnoitring trials between Hamburg, Münster and Cologne, with landing at Cologne (400 kiloms.).

D. Tactical reconnoitring trials near Cologne.

When the Circuit commenced at Darmstadt on May 17th, the following pilots had either been unable to pass the reception tests or had failed to appear at the time of the start: (1) Canter, (2) v. Detten, (20) Wentscher, (21) Anslinger, (22) v. Arnim, (23) Beck, (26) Höfig, (30) Steffens, (32) Hennig, (35) Schüler, (36) Schröder, (37) Sommer, (40) Weyl. At four o'clock on the 17th of May the start for the first stage of 400 kiloms., from Darmstadt to Frankfurt, was given. The first and second stages had to be completed between 4 a.m. on May 17th and 8.30 p.m. on May 19th. The first to go was Lieut. Beaulieu. The weather was clear, but somewhat gusty. From Mannheim it was reported that the other controls were not yet ready, a fact which delayed the start of the other machines considerably. At 4.29, however, everything was in order, and the second to start was Lieut. von Thüna, who was followed by the civilian pilot Viktor Stoeffler. Shortly after, Lieuts. Bonde, Schlemmer, Emrich and Walz got away, followed a little later by Lieut. von Hiddessen, Lieut. Buttlar and Lieut. Pfeifer. Schauenburg on the A.E.G. biplane got into the air very quickly, in spite of the comparatively heavy loading of his machine. Others sent off were Lieut. Mühlig-Hoffmann, Lieut. Kolbe, Thelen, Lieut. Ladewig, Schlegel, Lieut. Joly, Lieut. Geyer, Paschen, Lieut. Hantelmann, Lieut. Pretzell, Friedrich, Freindt, Krumsiek and Lieut. Kastner. At 5 a.m. 25 machines had departed. During the start Schröder arrived on the Sommer biplane. Laitsch, who had been busy all night repairing his radiator, left at 7.15, but the new radiator fitted also commenced leaking, with the result that the observer, Lieut. Koch, was covered with a spray of hot water, and Laitsch had to land again, and ultimately gave up the attempt. At seven o'clock news arrived that Lieut. Walz and his observer, Lieut. Müller, had had a fall near Morsbrunn, in which Lieut. Müller lost his life owing to the machine catching fire. First to arrive at the aerodrome at Rebstock near Frankfurt was Lieut. v. Beaulieu, who landed at 8.19 and started again on the second stage at 8.34. The next to arrive was Viktor Stoeffler, who made the best time over the first stage. The three fastest times made were: V. Stoeffler (Aviatik biplane), 3 hrs. 55 mins.; Lieut. v. Thüna (L.V.G. biplane), 4 hrs. 4 mins.; Lieut. Pretzell (Albatros Taube), 4 hrs. 12 mins. After a short rest the majority of the pilots started for the second stage of 375 kilometres *via* Wiesbaden, Coblenz, Cologne, back to Frankfurt. Several of the pilots had to retire during this stage. The best times made over this part of the course were:—Lieut. v. Thüna (L.V.G. biplane), 3 hrs. 9 mins., aggregate time, 7 hrs. 13 mins.; Lieut. v. Beaulieu (L.V.G. biplane), 3 hrs. 23 mins., aggregate time, 7 hrs. 40 mins.; Lieut. v. Buttlar (L.V.G. biplane), 3 hrs. 9 mins., aggregate time, 7 hrs. 48 mins.

The Prince Henry Prize for aeroplanes, in the Prince Henry Circuit, modelled by Karl Korschann, of Frankfurt, and won by Krumsiek.

Although three days had been set apart for the first and second stages, little flying was done on May 18th and 19th, as nearly all the competitors had either completed the course or withdrawn on May 17th. Lieut. Joly only got as far as Cologne on May 17th, and left for Frankfurt at 4.33 a.m. on May 18th, arriving at the latter place at 6.58 a.m. Lieut. Ladewig completed the first stage only on May 17th, and spent the night at Frankfurt, from where he started the next morning and completed the second stage by 8.25. Thelen was prevented by radiator trouble from completing more than the first stage on May 17th. He started again at 4.35 a.m. on May 18th and completed the second stage, arriving back at Frankfurt again at 8.56.

The third and fourth stages had to be completed between 4 a.m. on May 20th and 8.30 p.m. on May 22nd; but several of the competitors had either completed the last two stages on May 20th or were *hors de concours*.

4 a.m. on May 20th was the official starting time for the third stage from Frankfurt to Hamburg (440 km.), at which hour any competitor could get off. The first pilots arrived in Hamburg about 9 o'clock. Of these Lieut. v. Buttlar, Lieut. v. Beaulieu, and Lieut. v. Thüna took a short rest, whilst Lieut. Schlemmer continued on the fourth stage—*via* Hanover, Minden, Herford, Münster, Osnabrück, Bremen, back to Hamburg—without landing. Among those who did not arrive in Hamburg until May 21st were: Lieut. Ladewig, Lieut. Geyer, Lieuts. Schlemmer, Schauenburg and Thelen, whilst Lieuts. Hantelmann and Joly did not complete the last stage until May 22nd.

When the time limit for the fourth stage (565 km.) expired, at 8.30 p.m. on May 22nd, only 12 pilots out of the 40 entered, had officially completed the reliability trials. The days from May 23rd to May 25th, were set apart for Military reconnoitring trials in which 40 officer-pilots took part. Below we give the aggregate times of each competitor for the four stages (1,800 km.) of the reliability trials.

	h.	m.
1. Lieut. v. Thüna (L.V.G.-Mercedes, bi.)	17	16
2. Lieut. v. Beaulieu (L.V.G.-Merc., bi.)	17	29
3. Lieut. v. Buttlar (L.V.G.-Mercedes, bi.)	17	56
4. Lieut. Bonde (Albatros-Mercedes, bi.)	21	54
5. Lieut. Geyer (Aviatik-Mercedes, bi.)...	22	34
6. Krumsiek (Hansa-Taube-Mercedes) ...	23	14
7. Schauenburg (A.E.G.-Benz, biplane)...	26	31
8. Lieut. Schlemmer (L.V.G.-Merc., bi.)	26	52
9. Thelen (Albatros-Mercedes, biplane)...	27	34
10. Lieut. Joly (Gotha-Taube-Mercedes)...	28	14
11. Lieut. Ladewig (Rumpler-Taube-Merc.)	29	15
12. Lt. Hantelmann (Albatros-Taube-Merc.)	30	15

The Emperor's prize (for officer-pilots) was awarded to Lieut. von Thüna, and the Prince Henry prize (for civilian pilots) to Krumsiek. Prizes were also presented by the King of Bavaria, the Grand Duke of Baden, the Grand Duke of Oldenburg, the Duke of Braunschweig and Lüneburg, City of Cologne, City of Münster, Bavarian War Office, City of Hamburg, City of Bremen, Prussian War Office, the Prince of Hohenzollern, the Prince of Hatzfeldt, the Prince of Schaumburg-Lippe, City of Minden, County of Minden.

The following civilian aviators received 4,500 marks each; Krumsiek, Schauenburg and Thelen; whilst Stoeffler and Schlegel received 750 marks each.

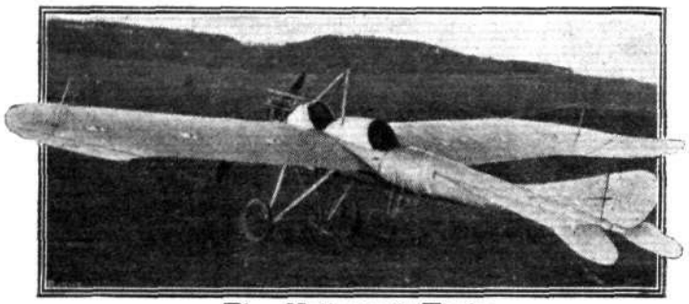
MACHINES IN PRINCE HENRY CIRCUIT.

On page 602 we give a table of the pilots and machines taking part, and a short description of some of the individual machines follow thereunder. For the photographs we are indebted to *Flugsport* and *Deutsche Luftfahrer-Zeitschrift*.

The **Halberstadt Taube** is characterized by a monocoque *fuselage* covered with fabric inside and out. The main planes are of the usual Taube form, but the girder structure under the wings has been replaced by ordinary cable bracing top and bottom. For purposes of observation and in order to facilitate photography openings have been provided in the wings on each side of the observer's seat, and these openings are fitted with glass covers. The chassis consists of two pairs of V tubes from which is slung the tubular axle by means of rubber shock absorbers.

The **Goedecker Monoplane** is also of the Taube type, but in this machine the girder structure under the wings has been retained, no top bracing cables being fitted. The wing spars, as in all Goedecker machines, are steel tubes, and provision has been made for quick erecting and dismantling. By substituting a pair of floats for the wheels, this machine can be very quickly converted into a hydro.

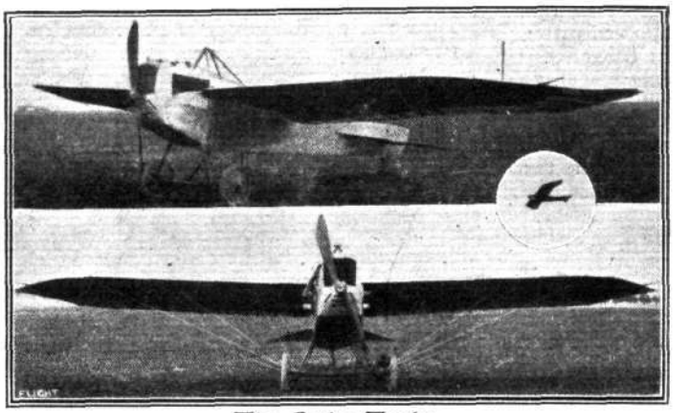
The **Jeannin Steel Taube** is, as the name implies, built of steel practically throughout. The main planes are of the usual Taube type with back-swept, upturned wing tips. Wing bracing of the ordinary kind is employed, the upper bracing cables being taken to



The Halberstadt Taube.

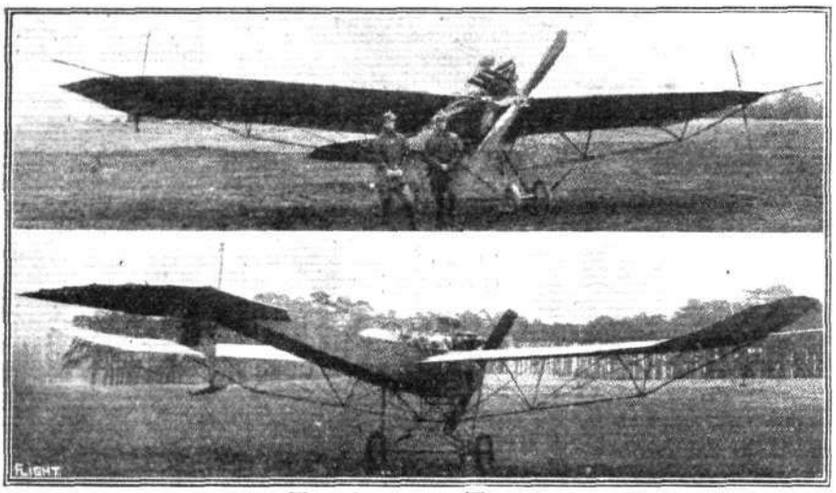
a top pylon, whilst the lower lift cables run to the lower extremities of the rear chassis struts. The divided axle, which is hinged to a short skid turned up in front to meet the nose of the *fuselage*, is sprung by means of telescopic tubes and rubber shock absorbers.

The **Gotha Taube** is one of the neatest of the machines entered, especially as regards the engine and radiator mounting, which has



The Gotha Taube.

works have brought out a new Arrow type biplane for the Prince Henry Circuit. It is chiefly interesting on account of the fact that it is fitted with a rotary engine—a 100 h.p. Gnome—enclosed by an aluminium shield. In the bottom of this shield an opening has been cut in order to allow the exhaust gases to escape. In designing this machine, great attention has been paid to accessibility and ease

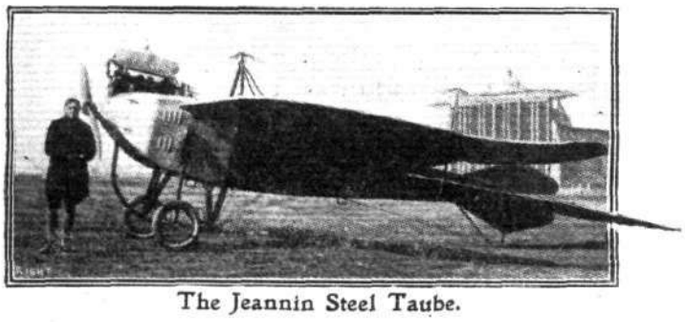


The Goedecker Taube.

The Schwade biplane.

been carried out in such a manner that the nose of the machine forms a very good entry for the air. The chassis is of the simplest form, and offers very little head resistance, as all the tubular chassis struts are of streamline section. The wheel axle is sprung from the chassis in such a manner that the wheels are free to move slightly sideways as well as in an upward direction.

The **Schwade Biplane** is the only machine of the pusher type



The Jeannin Steel Taube.

with a rotary motor entered in the competition. It is somewhat reminiscent of the Henry Farman biplane, having a very pronounced overhang of the top plane. The engine is an 80 h.p. Stahlhertz rotary motor mounted in the rear end of the *nacelle*.

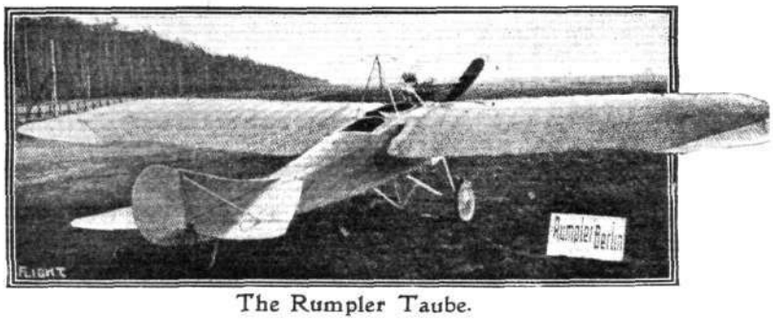
The **Rumpler Taube** is a very compact business-looking machine. The upper wing bracing, it will be seen, is now effected by cables running to a pyramidal pylon of steel tubes, and the Zanonia form of wing has been retained. Instead of the usual flexing wing tips, *ailerons* are fitted. These, it should be noted, are hinged along an axis forming an angle with the transverse axis of the main planes.

The **Sommer Arrow Biplane.**—The German Sommer Aircraft

of dismantling of the wings, an operation requiring only a few minutes' work.

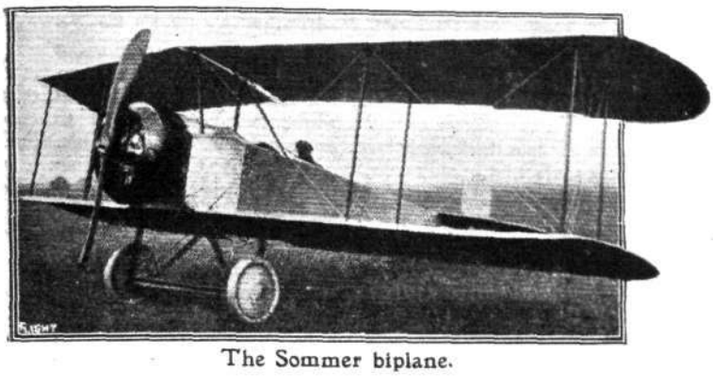
The **Hansa Taube** is practically identical with the Gotha Taube, with the exception of the wing bracing, which takes the form of a girder of steel tubes underneath the planes.

The **A.E.G. Biplane** is of the ordinary tractor type, having straight wings (as seen in plan, but set at a pronounced dihedral



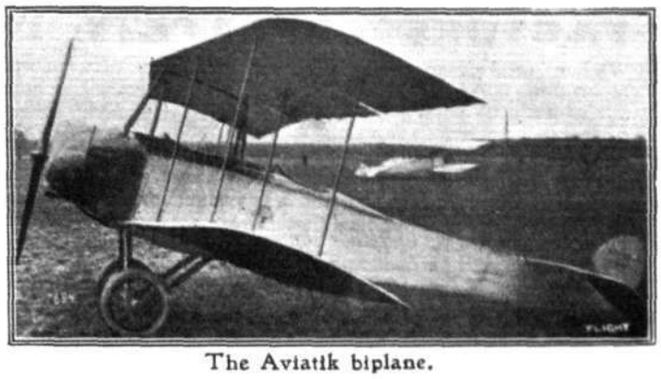
The Rumpler Taube.

angle). The main planes are so designed that for purposes of transport they can be folded flat along the sides of the *fuselage*. The chassis has three wheels, of which the front one, the object of which is to protect the propeller, is sprung by means of coiled springs on a steel tube sloping backwards to the nose of the *fuselage*.



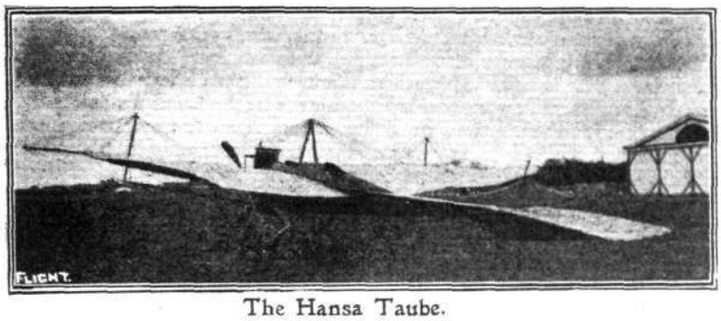
The Sommer biplane.

The **Aviatik Biplane** follows standard lines as regards the general arrangement of its component parts. It is of the "Arrow" type, now so popular in Germany, and has an all-enclosed *fuselage*. The chassis is of modern simple type without skids. Pilot's and passenger's seats are arranged tandem fashion, the pilot occupying the rear seat.



The Aviatik biplane.

The **Albatros Biplane** is practically identical with the machine flown at Hendon by Herr Thelen recently, when it was fully described in the columns of FLIGHT. The *fuselage* of this machine, it will be remembered, is built up without the use of internal cross wiring, the necessary rigidity being provided by the three-ply wood with which the *fuselage* is covered.

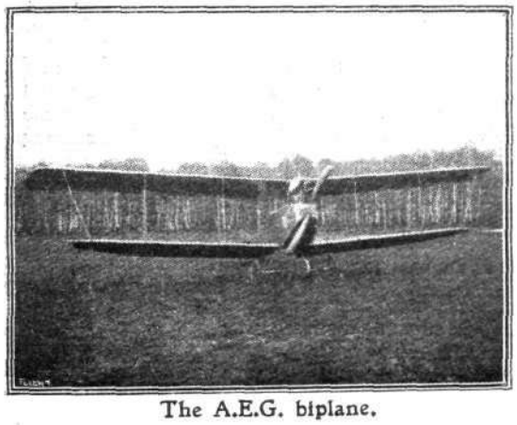


The Hansa Taube.

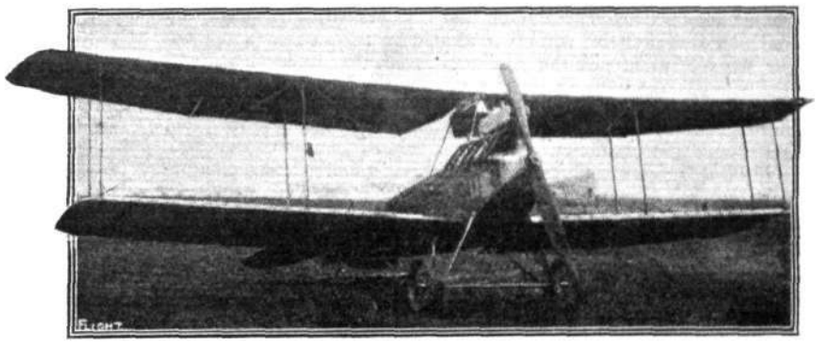
The Albatros Taube.

The **Albatros Taube** is characterized by a *fuselage* similar to that of the biplane with which our readers are already familiar through detailed descriptions in these columns. The wings are of the Taube type, and bracing is effected by a bridge girder structure of steel tubes under the wings. Provision has been made for folding the wings in a very short space of time. The chassis, which is also built of steel tubes, is very robust, and its different parts are standardised to facilitate interchange.

The **L.V.G. Biplane** is similar to those in use by the German Government, with the exception that the capacity of the tanks has been increased in order to allow of completing all of the various stages of the course without intermediate landings. These machines are, as will be seen from the accompanying photographs, of the tractor type, and have *fuselages* of similar shape to that of the Albatros biplane which was described in these columns some time ago.



The A.E.G. biplane.



The Albatros biplane.

The L.V.G. biplane.

The L.V.G. biplane.

FACTORS OF SAFETY DESIRABLE IN AEROPLANES.

WE have received an official *communiqué* from the War Office, a report from the Advisory Committee for Aeronautics. The Committee desire to call attention to some important considerations of a general character relative to the strength of the construction which it would appear desirable to attempt to obtain in the manufacture of aeroplanes—especially the strength of the wing. In view of the increasing severity of the conditions under which flights are now undertaken, they are of opinion than an endeavour should be made to produce machines having a higher margin of strength than is ordinarily allowed for in aeroplane design.

The term factor of safety is employed in a sense differing from that generally accepted in ordinary engineering usage, for whereas the engineer, after taking into account all known causes affecting the stresses a structure has to bear, allows a factor of safety to cover unknown sources of weakness, including defects in material and accidental errors of workmanship or design, in the case of the aeroplane the term is commonly used in relation to the calculated stresses in normal horizontal flight. The factor of safety, N, according to present usage is the ratio between the breaking stress in any part and the actual load carried by that part during horizontal flight in still air. The quantity N is to be regarded as made up of two separate factors, n and N_1, so that $N = nN_1$.

Of these N represents the maximum load, expressed as a multiple of the weight of the machine, which, so far as our knowledge goes, it may be expected to carry in flight, while n is a numerical factor by which we multiply N_1, in order to allow for uncertainty of calculations, flaws in the material, imperfect workmanship and the like. Of the two factors, the term factor of safety applies strictly only to n, and in what follows it is proposed so to apply it. We proceed to consider these two factors separately.

The weight of an aeroplane in horizontal flight in a steady wind is balanced by the resultant of the upward pressure on its wings, tail, &c., and the normal loading of the machine in this condition is equal to its weight. If the conditions of flight alter, the loading may be increased many times. Among the causes which contribute to this increase are gusts of wind, banking and flattening out, and it is desirable to form some idea of the effect of each of these.

Gusts.—Consider an aeroplane moving at its maximum speed in a horizontal wind, and suppose it suddenly enters a region where the wind, instead of being horizontal, has an upward direction, its speed remaining without serious alteration. The machine then experiences an upward gust; the angle of incidence on the planes is increased, the lift coefficient is increased, and the resultant upward thrust is in consequence increased. If we suppose that the maximum speed of the machine is twice its minimum speed, and that the attitude of the machine to the relative wind is so altered by the gust as to become that corresponding with the minimum speed, the lift coefficient will be increased four times by the change, and the loading immediately after entering the gust will be four times as great as previously; more generally the ratio of the two loadings will be equal to (maximum speed/minimum speed)^2.

Banking.—This again causes an increase in loading corresponding with the angle of banking. If we take 45° as an angle often reached, the loading will be increased in the ratio $\sqrt{2}$ or 1·4 to 1, or, more generally, in the ratio sec α to 1, if α is the angle the wings make with the horizontal.

Flattening Out.—The increase in loading due to this may be very great; it depends on the speed reached by the machine before flattening, and the rate at which the manœuvre is performed.

Let us take a machine in which the lift coefficient at maximum normal speed is one-quarter of the maximum lift coefficient, and suppose that in order to flatten out the elevator is put instantaneously at its greatest or most effective angle; and that as a result the machine at once takes the attitude corresponding with maximum lift coefficient. The speed reached on a steep dive or glide before flattening may greatly exceed the maximum horizontal speed; let us suppose it has double that value. Then, while flattening out, the speed is twice the normal maximum speed, the upward thrust 16 times as great as its normal value, and the loading 16 times as high as in steady flight. A limit, however, is put to this, not only by the muscular effort required—it assumes that the elevator can be put over instantaneously, which is impossible—but also by the fact that the velocity reached in falling will necessarily be very much reduced in the process of flattening out before the attitude assumed is attained. A more careful calculation, based on the best data available as to the possible speed, and curvature of the path, would seem to show that in a case such as assumed the loading might be as much as eight times its normal value, but could hardly exceed this, and this figure can be greatly reduced by limiting the permissible speed of the machine.

Thus we have as outside figures:—For gusts, 4; for banking, 1·4; for flattening out, 8; with the fact that the last can readily be reduced to, say, 6, if care is taken not to fly the machine at a speed much greater than its maximum normal horizontal speed.

The question next arises whether it is possible for these conditions to occur together. It is clear that (1) and (2) may happen simultaneously. A machine may encounter a gust when banking. To allow for this we must multiply the two numbers 4 and 1·4 together and we get 5·6 to 1 as the ratio in which the loading may be increased by gusts and banking combined. The probability that extra heavy loading as a consequence of a gust will occur at the exact moment of flattening out is not large, and we may deal with these two conditions separately. Even in the case of temporary loss of control, when exceptionally high velocities may be reached owing to a vertical fall, it must be remembered that the air pressure coefficient cannot exceed a certain maximum value which occurs usually at an angle of incidence of about 16°.

We may thus perhaps conclude that with proper precautions an aeroplane will not in ordinary use be loaded to more than 5 or 6 times its weight. This would lead us to put $N_1 = 6$ in our formula.

We have now to consider the value of n, the factor by which N_1 is to be multiplied to allow for various uncertainties; that is the factor of safety properly so called. If usual engineering practice were followed, n would be considerable. The limitations imposed by the conditions of flight prevent this for the present, and we must be content to rely on careful inspection of work and materials and rigid tests, wherever possible, but it is clear that with the utmost care in the inspection and choice of materials n should be at least 2. This would make the value of N to be 12, and it is considered that this figure should be aimed at in the near future.

At present this desideratum is far from being reached. The figures before the Committee as to the value of N vary from 3 to 7, and the Committee realise that it is not possible at once to attain so high a value as 10 or 12. They are strongly of opinion, however, that machines ought not to be accepted for service unless the value of N is not less than 6, and even then it would appear possible that an occasion may occur, under the worst conceivable conditions, when the machine will be loaded up to its calculated breaking stress. The calculations should be made on the assumption that each part of the machine may have to bear the stress which would be produced by loading the machine to three times its weight; the stress thus found, when doubled, should be less than the breaking stress of that part of the machine.

It is proposed to investigate further the questions involved in the realisation of the degree of structural strength which is held, on general grounds, to be desirable. In nearly all machines the parts in which weakness is most liable to occur are the main wing spars, and the weight of these spars is not large in comparison with the total weight of the machine. Meanwhile attention should again be called to the fact that the exceptionally high stresses referred to in this Report do not occur under the ordinary conditions of flight provided a machine is carefully handled, and cannot arise to anything like the same degree in the less efficient types of machine. In accordance with the recommendation of the Monoplane Accidents Committee, the Committee desire to express the opinion that steep dives should be avoided, whether the engine is on or off, and, so far as is possible, care should be taken in descending that a speed exceeding by more than 15 or 20 per cent. the upper limit of the speed range is never reached.

In conclusion, the Committee recommends:—

(i) That for the future no machine be accepted for service unless the strength of the wing structure is such that the ratio of the breaking stress of any part to the stress produced in that part by a load equal to three times the weight of the machine is at least two;

(ii) That steps be taken without delay with a view of raising this figure, as soon as may be found possible, to double the above value.

⊛ ⊛

New Special Reserve of the R.F.C.

AN Army Order issued on Wednesday night states that it has been decided to enlist a limited number of men for service in the special reserve of the Military Wing of the Royal Flying Corps. These men will not be organised in units, but will be trained annually with Regular squadrons, and will be available on mobilisation for service at home and abroad with the Royal Flying Corps (Military Wing), but not in the capacity of pilots. The age for enlistment will be from 18 to 40 years, and enlistment will be for a period of four years. Annual training will consist of fifteen consecutive days, and whilst doing annual training or other military duty pay will be at Army rates, as follows: Second-class air-mechanic, 2*s.* per diem; first-class air-mechanic, 4*s.*; corporal, 5*s.*; sergeant, 6*s.*; flight sergeant, 7*s.* Non-commissioned officers and men discharged in consequence of injuries received in the performance of military duty will be eligible for pensions.

FLIGHT

THE FLYING MACHINE FROM AN ENGINEERING STANDPOINT.

By FREDERICK WILLIAM LANCHESTER, M.Inst.C.E.

(*Continued from page* 577.)

Summarizing the position, it is clear that the tractive effort required to overcome flight resistance proper, namely, the aerofoil resistance, need not exceed 1 in 12 to 1 in 14, that is, 7 or 8 per cent., using an aspect ratio of about 6, and that values less than this are to-day actually reached in existing machines. It is futhermore apparent that if it is found practicable to employ really high aspect ratio, such as in my early flight models, there is every reason to suppose that a resistance coefficient as low as 6 per cent. or even 5 per cent. may prove to be attainable. This is the magnitude of the "constant gradient" of the motor-car analogy. We now pass to the consideration of body resistance.

4. *Body Resistance.*—The body resistance, as already stated, varies approximately as the square of the velocity. It is therefore evident that, with a machine of given weight, since the flight resistance proper (the aerofoil resistance) is constant, the higher the flight-speed the more serious relatively does the question of body resistance become, and the design of the car and its accessories, such as alighting gear, &c., is a matter of increasing importance as the contemplated flight velocity becomes greater. The calculation of body resistance involves the computation of the resistance of each individual element, and in some cases allowance for the interference or influence of one element or portion of another. Thus in the computation of body resistance it is necessary to have at command tabulated results of the resistance of spars of various sections, wires, wheels, and the like, in addition to a sufficiency of known data as to stream-line forms of various degrees of perfection. A considerable amount of experimental data has now been collected in this direction, but a great deal yet remains to be done.*

The resistance of the body-shape or *fuselage* is a factor on which at present the information available is at least satisfactory, since it is rarely possible for the designer to adopt a close approximation to a perfect stream-line form, or a form for which the resistance coefficient has been already determined; it is usually necessary to have recourse to model experiment in each individual case. This is no more than must be expected, in view of the fact that the same applies to the design of a ship's hull when any departure is made from existing practice.

A very few years since little or nothing was known as to the resistance of the so-called stream-line or ichthyoid body. In 1908-09 I made enquiries in the endeavour to obtain some figures on this subject. For bodies constituting a rough imitation of a good fish form, with ratio of length to diameter of about 6 to 1, the figures given in Table VII were supplied by the different authorities

TABLE VII.

Authority.	Date.		Remarks.
Prandtl	1908	0·125	Given as approximate only
Colliex	1908	0·100	From rough experiments at the factory of Voisin Frères
Surcouf	1908	0·031	Given as an experimental determination by the late Col. Renard
British Admiralty	1909	0·032	Actual for water (ratio about 3 : 1)
		0·023	Probable for air

named; the figures, given to me in various forms, are here reduced to represent the equivalent of normal plane in terms of the maximum cross-section.

It would appear from more recent experiments carried out at the Royal A.F., and at the N.P.L., that for a well-designed stream-line form the best result so far recorded is approximately 0·07, the coefficient of fineness length/diameter being round about the value 4 : 1.

The plotting given in Fig. 20 is based on a series of determinations made at the R.A.F., with corrections (for which I take responsibility) to compensate for the difference in the coefficient of skin-friction between the velocity, 20 ft.-secs., actually employed, and an assumed flight-speed of 70 miles an hour. The plotting represents the resistance coefficient for bodies of about 2 to 3 ft. diameter.

When we turn our attention to the design of the body of machines as they exist to-day, we find that although it is becoming customary to give the *fuselage* a distinct fish-like outline, it is rare that any real attempt is made to adopt a definitely stream-line or true ichthyoid form, such as employed for the experimental determinations already cited, and commonly used for dirigible balloons. It is not sufficient to give a rough general outline to the body if a material reduction in the resistance is required; it is necessary to go further than this, and to avoid as far as possible corners and projections of every description. In many cases in the body-forms used to-day the resistance is nearly as great as that of a normal plane equal to the mid-section area, and a body with a coefficient of less than 0·5, in

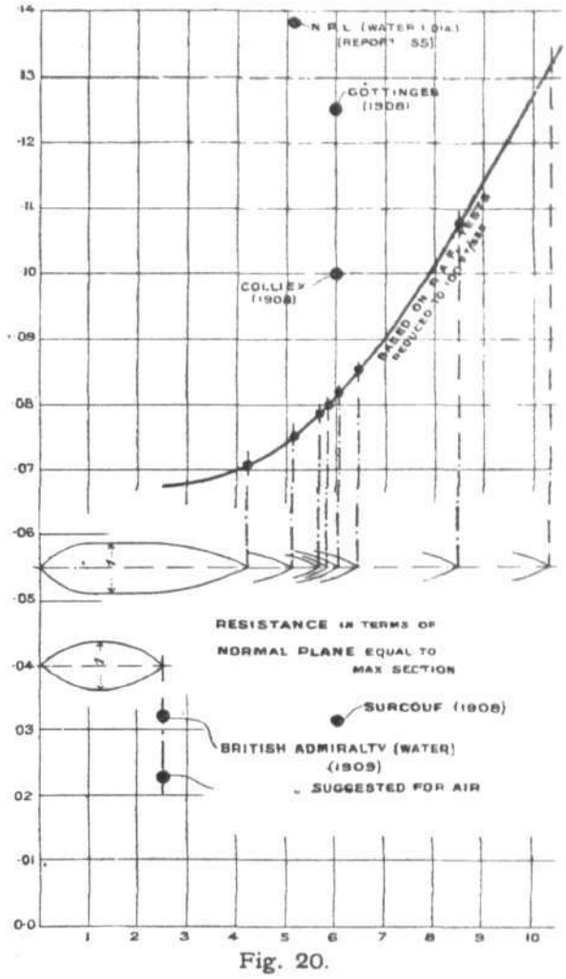
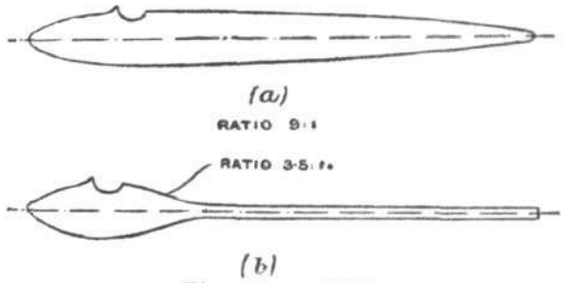


Fig. 20.

view of current practice, must be regarded as exceptionally good. As a consequence the resistance of the *fuselage* and passengers alone is often equivalent to some 3 or 4 sq. ft., whereas an equivalent considerably less than 1 sq. ft. ought to suffice. It is not only necessary to avoid up-standing projections such as wind-screens, &c., but even such things as longitudinal angles should be eliminated from the design; this latter point has been partially investigated by the N.P.L.



Figs. 21*a* and 21*b*.

In the Paulhan-Tatin machine, mentioned in the researches of Mr. Eiffel, the question of body form has been studied with extreme care, the form of body employed being substantially a solid of revolution, as given in Fig. 21*a*. The only irregularity in the *fuselage* is in the aperture for the pilot's body, which has clearly been reduced to the minimum possible. According to the results given in Fig. 20 it would be still better, from the point of view of resistance, to design the body on the lines shown in Fig. 21*b*, making the body only of sufficient length to contain the pilot, motor, &c.,

* For the resistance coefficients of spars, wires, &c., reference should be made to the various reports of the Advisory Committee and the work of Mr. Eiffel and others, also section 9 following.

and carrying the tail organs from a tubular continuation. A model of this kind, made and tested at the N.P.L. (from designs of the R.A.F.), gave a normal plane equivalent of about one-fifth of its maximum cross section. The form was imperfect as a stream-line body, and the small scale ($\frac{1}{15}$ full size), otherwise rendered the resistance higher than it would be in actuality.—Advisory Committee Report 74, p. 177.

It is evident that with sufficient experience the body *fuselage* resistance of an ordinary two-seat machine should be capable of reduction to the equivalent of 1 sq. ft. area of normal plane, since a good model of stream-line body of 5 sq. ft. maximum section should in itself offer less than half this resistance. Added to this we have the alighting chassis and auxiliary surfaces, the resistance of which should be capable of being designed for an equivalent of 2 sq. ft. if the design be studied in every detail, making 3 sq. ft. in all. On the basis of 80 miles an hour the resistance will then amount to 60 lbs., or say, approximately, 5 per cent. The body resistance in the machines of to-day is very much higher; it is commonly the equivalent of at least some 5 sq. ft. of normal plane: Mr. Eiffel gives 1 sq. metre (= 10 sq. ft.) as usual.

5. *Total Resistance.*—Fig. 22 represents graphically the position with which the designer has to cope; the horizontal line *a a* represents an aerofoil resistance coefficient of 7 per cent. The curve 2 represents (from *a a* as datum) the additional coefficient due to body resistance on the assumption that we are dealing with a machine of 1,200 lbs. weight, in which the body resistance has the equivalent of 2 sq. ft. area of normal plane curve, 3 represents similarly the added body resistance on a basis of 3 sq. ft.; lines 4 and 5, 7 and 10 represent 4, 5, 7 and 10 sq. ft. respectively; curve 5 may be

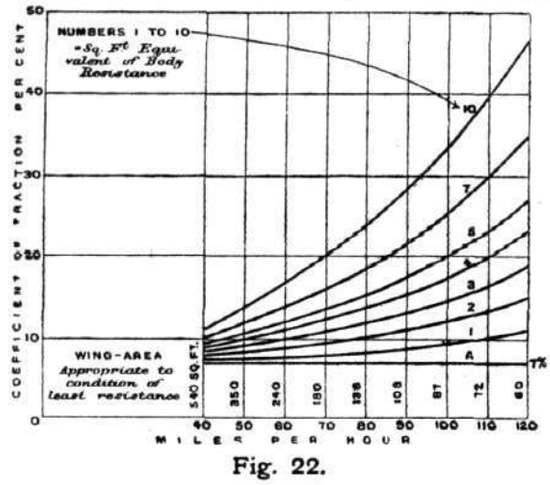


Fig. 22.

taken roughly to represent the best practice at the present time. It is evident that so long as flight-speeds were limited to 40 miles an hour or less, as was the case a few years ago, the body resistance remained a matter of minor importance; in fact, in the Wright machine, and in several other machines of that day, the pilot sat fully exposed, and little or no attempt was made to minimize resistance, whereas with speeds of 80 miles an hour the body resistance will, unless great care is taken in the design, considerably exceed the flight resistance proper. Fig. 22 does not represent the resistance of a given machine flown at different speeds, but rather the resistance of a series of machines of given weight, *each designed for least resistance at its own particular speed*, and with body resistance equivalent to the area indicated.

Referring to Fig. 22, it will be seen that the total traction coefficient in the case of curve 5 at 80 miles an hour is roughly 15 per cent., the gliding angle consequently being 1 in 6·7: this is slightly better than the best figures actually obtained in the military trials of 1912. The highest speed at the military trials did not touch 70 miles an hour, so that on the basis given the gliding angle should have been better than stated; no allowance was made for the drag of the propeller, it is possible the difference is due to this factor.

The question of body resistance has for some time been a matter of careful study by the staff of the Royal Aircraft Factory, and I understand that in some of the later models the equivalent normal plane area has been very considerably reduced. If we take an aerofoil coefficient of 7 per cent., and a curve representing 3 sq. ft. equivalent normal plane, we find that at 80 miles an hour the gliding-angle, or the resistance coefficient, should be approximately 12 per cent.; or at 60 miles per hour 10 per cent.; I believe this figure to be in sight, though it may not yet have been actually reached.

As illustrating the extent to which the present-day results have been anticipated by theory, in 1907, dealing with the question of the power expended in flight, I tabulated the results of calculations for gliding-angles as for complete machines ranging from 12° (approximately 1 in 5) to 6° (approximately 1 in 10). In the military trials of 1912 the worst gliding angle recorded was 1 in 5·3, and (as pointed out in the preceding paragraph), the present-day figure is gradually approaching 1 in 10.

If we try in the light of present data to look into the future it seems probable that the limiting gliding angle, or, rather, the minimum total coefficient of resistance, may even be materially less than 1 in 10; thus if it is found possible, in spite of structural difficulties, to obtain equal results in an actual machine to those obtained in wind channel model tests, namely a coefficient of resistance for the aerofoil approximately to 5 per cent., and if the body area equivalent, for a machine of 1,200 lbs. gross weight, can eventually be reduced to 2 square feet, a total coefficient of resistance as low as 8 per cent. may prove well within reach; whether the sacrifices necessary in order to achieve such results in practice would be justified the future alone can decide. The solution of any engineering problem is always to some degree a matter of compromise, and it would be rash to suggest that in the case of the flying-machine there are not considerations of sufficient importance to render it inadvisable to run after the last 1 per cent. reduction in tractive effort. A graph is given representing the coefficient of resistance on the basis of the present paragraph in Fig. 23. The aerofoil coefficient of traction is taken at 5 per cent. the weight of the machine as before assumed as 1,200 lbs., and the suggested total of 8 per cent. corresponds to a flight speed of nearly 80 miles an hour.

Before we have finished with the question of resistance we need to know something as to the gradient of ascent, or climbing-power required. A machine that is only capable of horizontal flight is evidently quite unserviceable; it is well understood, too, that any machine with an insufficient rate of ascent is intrinsically dangerous; not only does it remain too long at low altitude, where any "fluke" in the wind is liable to bring about disaster, but in bad weather when buffeted about by the wind a pilot may find himself incapable of making altitude altogether if his initial margin of power is insufficient.

The rate of ascent for which provision has to be made depends very much upon the service for which the machine is required, for the ordinary needs of the aeronaut who wishes to make cross-country flights under fair weather conditions, a margin of power representing an upgrade of 5 per cent. or 6 per cent. appears to be ample; there is probably no real advantage in any greater provision. For military or naval service, on the other hand, there are without doubt occasions when everything may depend upon the rapidity at which the machine can make altitude. I feel that I cannot do better than quote from the specifications given by the Superintendent of the R.A.F. for two types of machine—namely, R.E. 1 Reconnaissance aeroplane, and F.E. 3 Gun-carrying aeroplane (*see* Report Advisory Committee 1912-1913, p. 267). For the first of these the rate of climbing demanded is 600 ft. per minute, or, taking the normal flight-speed at 70 miles per hour (the specification gives maximum 78 miles per hour, and minimum 48), we have a climbing gradient of approximately 10 per cent. For the gun-carrying machine the speed is given as 75 miles per hour, and the rate of climbing 350 feet per min., which, expressed as climbing gradient is a trifle less thon 5½ per cent. Manifestly a machine carrying a gun of some kind (presumably a machine gun), and we may assume an adequate supply of ammunition, and perhaps a few square feet of bullet-proof armour plate, needs to sacrifice something in the matter of climbing power.

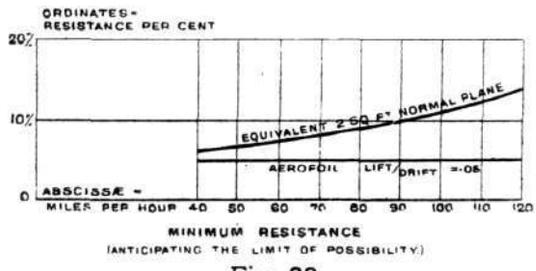


Fig. 23.

There is good reason to suppose that if a demand for higher speeds than those at present attained is in the future to be satisfied, success will depend to some extent upon our ability to build larger and heavier machines. By reference to Figs. 22 and 23 it will be seen how soon with increased flight speeds the question of body-resistance becomes a disproportionate factor; it is manifestly impossible in a machine of given size to reduce the equivalent normal plane area beyond a certain point, but it is evident that by increasing the weight and power of the machine the effect of such body-resistances may be rendered less important since an increase in weight and power does not require a proportionately serious increase in the size of the members to which the body-resistance is due. Also since the square of the product of l and V varies directly as the weight (where l represents the linear size of the aerofoil) the value of ξ is also a function of the weight and diminishes slightly as the weight is increased. (*To be continued.*)

FLIGHT

FOREIGN AIRCRAFT NEWS.

New Regulations for French Military Pilots.

Under date of May 20th the French military authorities have issued new regulations regarding the qualifications for aeroplane, balloon and airship pilots employed by the French Army. It is notified that the only certificate now recognised for aeroplane pilots is the military or, as it is more usually called—the superior certificate, for which the conditions are made more severe each year. For balloonists two certificates are recognised, the ordinary F.A.I. *brevet* and the superior certificate issued to officers and non-commissioned officers who have undergone a certain course of training. For dirigibles there are two *brevets*, pilot's and mechanic's; the former is issued to officers and non-commissioned officers who fulfil certain requirements, while the latter is granted to non-commissioned officers and men who pass through a course of training.

Fine Flight by Caudron Escadrille.

AT the end of last week an escadrille of six Caudron biplanes, stationed at Douai and commanded by Capt. Peralda, completed a flight of 800 kiloms., calling at Evreux, Rouen, Dieppe, Crotoy and Calais.

2,000 Kiloms. on a Rep.

ON Wednesday and Thursday of last week, Lieut. Campagne, on a Rep, fitted with an 80 h.p. Gnome motor, made a cross-country flight of 2,000 kiloms., starting from and finishing at Rheims, with stops at Nimes, Castelnaudary, Bordeaux and Buc.

Geneva to Lyon on a Dep.

ON the Deperdussin monoplane which he had purchased from Vidart, the Swiss pilot, Durafour on the 28th ult. flew from Geneva to Lyon in 1 hr. 20 mins., not counting a short stop which was made at Amberieu.

A Prize for Hardelot Visitors.

THE Society of Hardelot is offering a prize of 1,000 francs for the aviator who between June 1st and September 30th, makes the greatest number of landings on the beach at Hardelot. Only one landing may be made per day and it must be preceded by a cross-country flight of at least 30 kiloms.

Verrier's Flight for Pommery Cup.

THE distance flown by Verrier in his winning flight for the Pommery Cup from Buc to Genthin in Germany has now been checked by geographical experts of the French Army and found to be 818·1 kiloms.

New M. Farman for French Army.

AT Buc on Saturday last, Capt. Destouches and Capt. Grard witnessed tests with the new Maurice Farman biplane built for the French Army. The new machine has a span of 15·5 metres and is fitted with an 80 h.p. De Dion motor. The maximum flying speed is 105 k.p.h. and the minimum 55 k.p.h., but in one test with four hours' fuel on board and a passenger, Fourny flew at a speed of but 35 k.p.h. The machine leaves the ground after a run of only 50 metres and can be pulled up in a like distance. It can climb 1,000 metres in 9 mins. while it is designed to carry a useful load of 305 kilogs. A feature of the machine is the comfortable accommodation for both pilot and passenger, who are well protected from wind and rain.

A Pupil Drowned at Nice.

WHILE a pupil, named Agostani, at a flying school at Antibes, near Nice, was flying over the sea on Saturday, the machine side-slipped when a sharp turn was attempted about half a mile from the shore. The pilot was drowned before help could reach him.

Aerial Touring.

ACCOMPANIED by Rougerie, Maurice Farman, on one of his latest type machines on Saturday flew from Buc to Etampes by way of Limours, Dourdan, &c., and later in the day returned by Rambouillet. Eugene Renaux, on a similar machine but with a 100 h.p. motor, flew from Etampes to Buc for the purpose of testing a new propeller, and afterwards took a passenger across to St. Cyr.

Flying in Morocco, &c.

AFTER resting at Oudjda since May 11th, when they completed their flight from Tunis, the escadrille of five Farman machines, piloted by Lieuts. Cheutin, Menard, Battini, and Sergeants Hurard and Benoit respectively, on the 27th ult., flew the 250 kiloms. from Oudjda to Taza, being joined on the way at M'Coun, where a stop was made for replenishments, by three Deperdussins, piloted by Lieuts. Lalanne, Radisson, and Magnien. The next day the Farmans made a non-stop flight back to Oudjda. A further 410 kiloms. were covered in a flight to Tendrara and Bou-Denib on the 29th ult., while on Sunday last Lieuts. Battini and Menard and Sergeant Benoit flew the 160 kiloms. to Colomb-Bechar. Throughout these flights each pilot is accompanied by a mechanic. Since it started on May 6th from Tunis, the escadrille of 80 h.p. Gnome-H. Farmans has covered 2,300 kiloms.

A Fatality in Russia.

IT is reported from Odessa that on Saturday last the machine of Lieut. Kouzminski fell from a great height. The pilot was killed on the spot, and the observer, Lieut. Toustanowski, was seriously injured.

Mr. Thornely on his biplane at the Münster Aerodrome, where he has been giving looping exhibitions last week, during the time that the Prince Henry flight was in progress. Tweer was also looping on a Blériot.

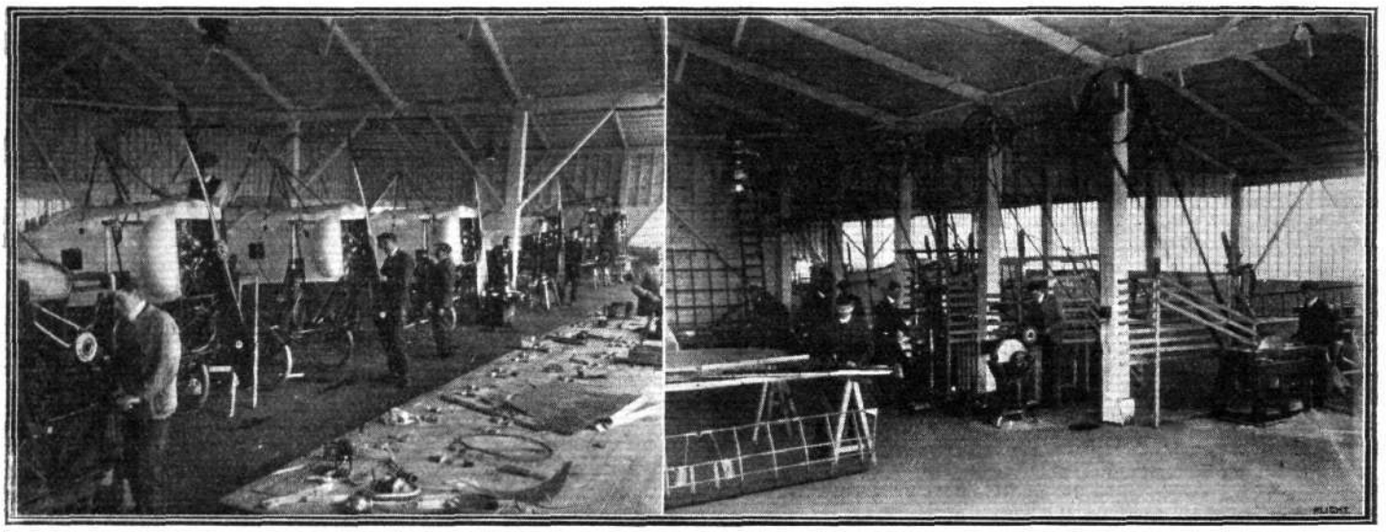
BLÉRIOT ACTIVITY.

ALTHOUGH the Blériot works at Brooklands have been in operation a few weeks only, M. N. Chereau, their general manager, has already made an excellent start by turning out a number of 80 h.p. two-seater British built Blériots. These machines, which were ordered by the British Government, are built at the Brooklands works throughout, and the workmanship is equal to, if not indeed better, than that of the French built machines. As one would expect from so capable a manager as M. Chereau, the works are excellently arranged.

Five of the hangars have been turned into one large erecting shop, the size of which may be easily realised by a glance at the accompanying photographs. About half a score of machines may be erected at one time, whilst in the woodwork department adjoining the erection shop are to be found all the latest improvements in woodworking machinery. The various departments are in charge of experienced foremen, each of whom is an expert in his own particular line of work.

The hangars adjoining the works have been turned into roomy well lighted offices, whilst another hangar is at present being turned into club rooms for the Blériot pupils. The front portion of this hangar will, when finished, be a lounge in which pupils can discuss the events of the day over a pipe, and at the back of this lounge the building will be divided into a number of small cabins, each assigned for a pupil, so that those of the pupils who wish to do so, may bunk in his cabin so as to be at hand early in the morning, and thus save valuable time, and draw advantage of the morning calms without wasting time in getting down to the aerodrome. We understand from M. Chereau that arrangements have been made with the authorities to train officers of the re-erve and to offer facilities for those officers who have already obtained their *brevets* to practice at the Blériot school. With the works close at hand to effect repairs, and with the extensive accommodation for the personal comfort of the pupils, the Blériot school should become very popular both among officers and civilians.

The instruction will be in the hands of M. Jules Teulade-Cabanes, who has been appointed chief instructor, whilst Mr. Edwin Gower, who has been flying Blériots at Buc, will be chief pilot. Several 80 h.p. two-seaters of the new type will be manufactured shortly in addition to a number of school machines ranging from 50 h.p. *brevet* machines down to pingouin taxying machines.



A couple of interior views of the new British Blériot works at Brooklands. On the left a view of half a dozen machines in the shop, and on the right a portion of the wood-working department is seen.

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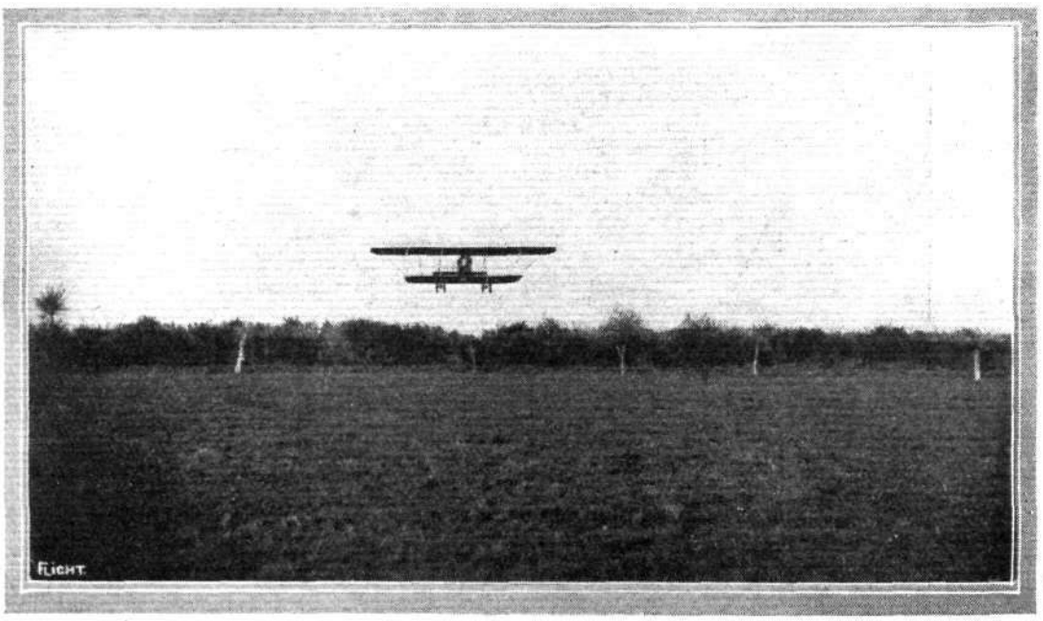
Mr. Churchhill's Long Flight.

A CROSS-COUNTRY flight of a little under sixty miles was made by Mr. Winston Churchill on the 29th ult., when he was a passenger on a biplane piloted by Major Gerrard, of the Central Flying School, from Upavon to Portsmouth. Mr. Churchill had spent several days at Upavon, during which he had several flights over Salisbury Plain with Major Gerrard.

Lectures on Aeronautics at East London College.

THE first of a course of four lectures on Aeronautics, dealing with the Stability and Control of Aeroplanes was delivered by Mr. A. P. Thurston, D.Sc. A.F.Ae.S. at East London College, Mile End Road, E., on Wednesday last. The remaining lectures, which are open to the public, free of charge, will be given on succeeding Wednesdays.



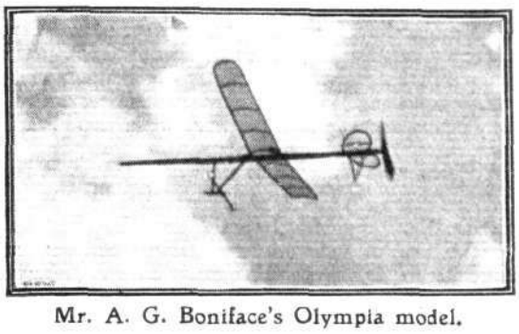
A snap of the brothers James on their biplane at Narberth, South Wales, where they are doing regular air work. The photograph shows the machine getting off in a field with the limited space of 200 by 220, which should give good practice for cross-country work.

Models

Edited by V. E. JOHNSON, M.A.

Mr. A. G. Boniface's Olympia Model.

THIS machine, which was exhibited at the last Aero Show, is of the single propeller tail type. The spar is 4 ft. long by $\frac{3}{8}$ in. sq. silver spruce, being streamlined and braced with a central king-post on top only. The main plane is tapered slightly with a fairly deep camber washing out towards the tips, and a small dihedral angle; the span is 36 ins. and average chord $5\frac{1}{2}$ ins. The tail is quite flat, having a span of 10 ins. and an area of 34 sq. ins. The main plane



Mr. A. G. Boniface's Olympia model.

has an angle of incidence of 4°. A chassis, of the central skid type, is employed. The bamboo struts are attached on either side of the spar in order to accommodate the rubber underneath. The main feature of the chassis is the sprung axle which is lashed to the skid by a tight rubber band. This arrangement is similar in action to the leaf-spring in the Nieuport chassis, and has proved to be far superior to the perfectly rigid chassis, which often becomes *bois-cassé* in very rough landings. A double wire skid underneath the tail keeps the propeller clear of the ground. The power unit consists of an "integral" type screw of 10 ins. diameter and 18 ins. pitch driven by nine strands of thin $\frac{1}{4}$-in. strip rubber. The total surface is 228 sq. ins. and weight $6\frac{3}{4}$ ozs., thus giving a loading of $4\frac{1}{4}$ ozs. per sq. ft. The stability of this model is much better than that exhibited generally by the single-screw canard type of machine, and a flat steady glide with the propeller stationary is executed at the end of each flight. The model has frequently climbed to well over 80 ft. The best duration accomplished to date is 100 secs.

A Model Chassis, Pilot's Seat and Control.

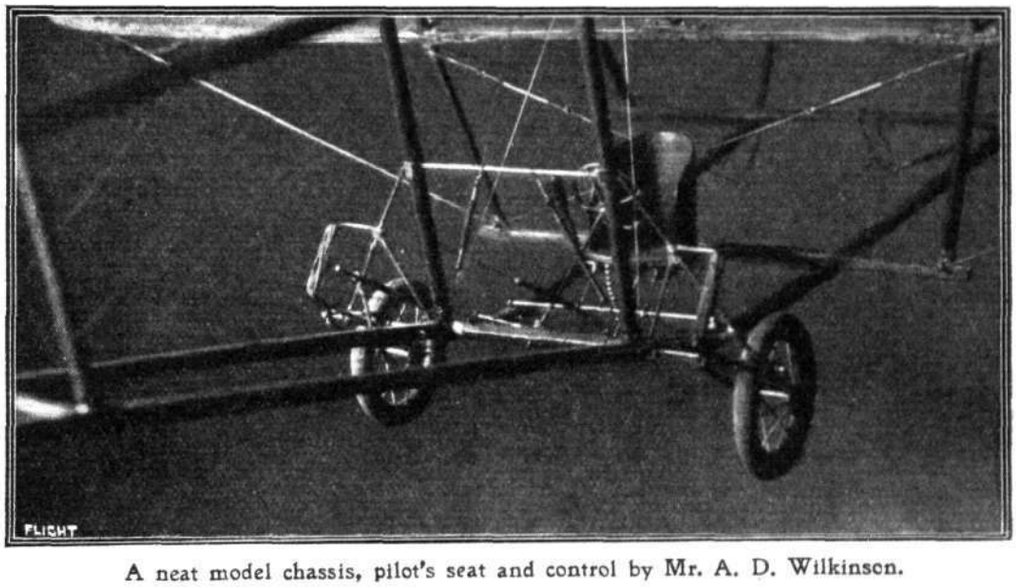
Mr. A. D. Wilkinson (Winnipeg, Western Canada), sends us the following description and accompanying illustration of an interesting model chassis, &c., employed by him on his new I-2-P2-0 model: "The elevator is controlled by a spring and ratchet, actuated by a lever to the right of the pilot's seat. The rudder is operated by wires from the automobile control (made of cycle spokes). There is another lever behind the elevator control, not shown in the illustrations, connected to the *ailerons*. The rubber sprung wheel-forks and all the metal portion of the landing carriage are made from cycle spokes. The machine is 45 ins. over all, with an upper main wing span of 36 ins. The rubber motor refuses to work (unwind) in below zero weather, but I tried the machine some time ago in a snowstorm and accompanying rise of temperature and it flew 100 yds. across the Red River, further progress being interrupted by a tree."

Mr. L. S. Wyatt's Models.

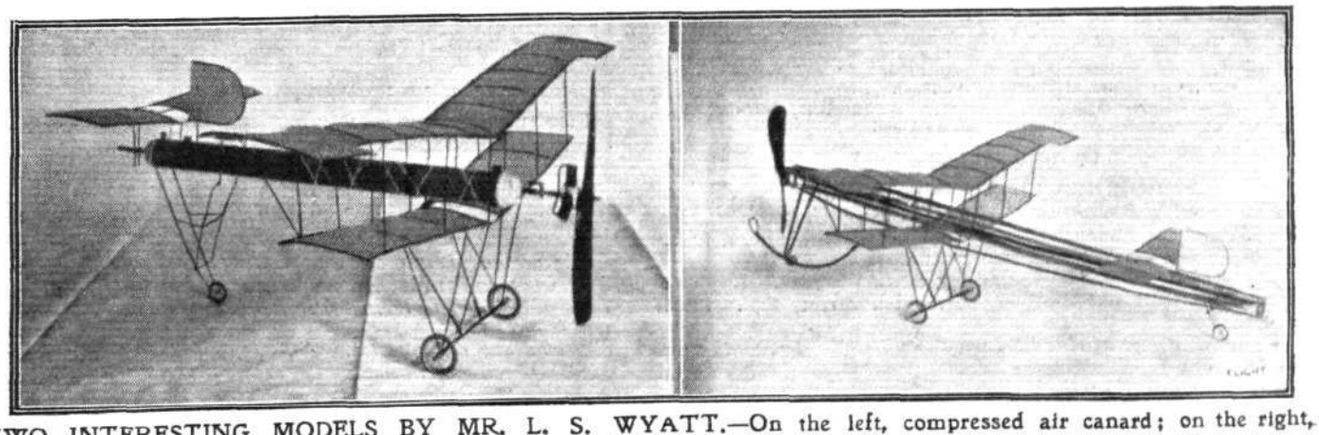
"I send you two photos, with dimensions, of two recent models I have made, which I intended to exhibit at Olympia, but could not get finished in time," writes Mr. Wyatt.

"One set of main planes and rudder serve both models as required, although quite different in themselves, the wheels being sprung fixtures to the above planes. Both are good fliers in the stability sense, but the rubber-driven model flies *three* times the distance of the compressed air plant." [Readers should carefully note this interesting item.—V.E.J.]

"*Compressed air plant* (canard type model): Single air chamber or reservoir purchased by itself, 3-cylinder rotary engine, 12-inch propeller, 20-inch pitch. *Main planes*, upper 30 in. span, 5 in. chord, with extended flaps. *Lower plane*, 20 in. span, 5 in. chord, gap



A neat model chassis, pilot's seat and control by Mr. A. D. Wilkinson.



TWO INTERESTING MODELS BY MR. L. S. WYATT.—On the left, compressed air canard; on the right, rubber tractor.

5·25 ins. Length of machine, 26·5 ins. *Elevator*, 12 in. span, 4 in. chords divided in two. *Landing chassis* sprung on four steel springs top and bottom. All struts and chassis rods fastened to steel clock springs with $\frac{1}{16}$ in. bolts and nuts. Weight complete, 12½ ozs.

"Everything takes to pieces in about 10 mins.

"*Rubber driven model* (tractor) geared 2 to 1 cogs. 18 strands ¼ in. strip rubber. Length of motor rod, 38 ins. 12 in. tractor screw, 21 in. pitch.

"Main planes as before, with same rudder and elevator. In the photo. the fabric covering the body is omitted to show the construction. The two top longitudinals are ash, the bottom one of bamboo, into which the skid is fastened, making an efficient shock absorber, the bamboo 'giving' about 1·5 ins. on landing. The tail end of this member is fastened with two $\frac{1}{16}$ in. bolts to the body to allow the planes to slide off. The c.g. is arranged aft of the planes when starting off the ground by the position of the wheels, and is in the right position when flying. Two miniature wheels are fixed in the skid to allow better landing. The back wheel is also sprung. Total weight 16·5 ounces. Steel is employed throughout in the construction of the first model, and also in this, except motor, *fuselage* and skid.

"I shall be pleased to supply anyone wanting drawings with the same."

KITE AND MODEL AEROPLANE ASSOCIATION.

Official Notices.

British Model Records.

Single screw, hand-launched	Duration	D. Driver...	...	85 secs.
Twin screw, do.	Distance	R. Lucas ...	...	590 yards.
	Duration	G. Hayden	...	137 secs.
Single screw, rise off ground	Distance	W. E. Evans	...	290 yards.
	Duration	W. E. Evans	...	64 secs.
Twin screw, do.	Distance	L. H. Slatter	...	365 yards.
	Duration	J. E. Louch	...	2 mins. 49 secs.
Single-tractor screw, hand-launched	Distance	C. C. Dutton	...	266 yards
	Duration	J. E. Louch	...	91 secs.
Do., off-ground	Distance	C. C. Dutton	...	190 yards.
	Duration	J. E. Louch	...	94 secs.
Single screw hydro., off-water	Duration	L. H. Slatter	...	35 secs.
Single-tractor, do., do.	Duration	C. C. Dutton	...	29 secs.
Twin screw, do., do.	Duration	L. H. Slatter	...	60 secs.
Engine driven off grass	Duration	D. Stanger	...	51 secs.

Competitions.—Entries for the *Model Engineer* Competition close this Saturday, June 6th, and any intending competitor should forward entry to H. A. Lyche, Esq., at 46, Templesheen Road, East Sheen, S.W. The 5th Annual Contest for the Gamage Cup will be held on Wanstead Flats on Saturday, June 27th, at 3 p.m. Entries close June 20th.

Official Trials.—The next official trials will take place on Wimbledon Common, on Saturday, June 20th, at 3 p.m., for the purpose of establishing records. It is hoped that members and friends will turn out on this occasion. Application forms can be obtained from the Gen. Hon. Sec., and must be returned to H. A. Lyche, Esq., 46, Templesheen Road, East Sheen, S.W., by June 13th.

Bristol International Exhibition, July 13th to 18th.—In connection with this exhibition an aviation section for models is being organised by the Bristol and West of England Aero Club. Prizes to the value of £17 are being offered. Full details will appear under the Bristol Club's notices. Any member or reader wishing for full programme of the meeting can have one forwarded by sending Mr. Akehurst a stamped addressed envelope.

27, Victory Road, Wimbledon. W. H. AKEHURST, Gen. Hon. Sec.

AFFILIATED MODEL CLUBS DIARY.

CLUB reports of chief work done will be published monthly for the future. Secretaries' reports, to be included, must reach the Editor on the last Monday in each month.

Leytonstone and District Aero Club (64, LEYSPRING ROAD).

JUNE 7TH. flying on Wanstead Flats, 6.30 a.m. At 10.30 a.m., twin-screw duration competition, 8-oz. models. 4-oz. loading models must rise off grass.

UNAFFILIATED CLUBS.

Finsbury Park and District (66, ELFORT ROAD, HIGHBURY, N.).

JUNE 6TH, practice flying at Finsbury Park, 3 p.m. H.l. duration contest for tractors at 5 p.m.

Scottish Ae.S. Model Ae.C. (5, DOUNE QUADRANT, GLASGOW).

JUNE 6TH, 13th and 20th, Paisley Racecourse, h.l., r.o.g., tractors. June 13th, second competition for "The Arthur Corbett Cup." Type, r.o.g. 25th, 26th and 27th, B C. Hucks and D. Manton at Scotstoun Show Ground, Whiteinch. July 4th, third and final competition for "The Arthur Corbett Cup." Type, waterplanes, at Maxwell Park Pond.

S. Eastern Model Ae.C. (1, RAILWAY APPROACH, BROCKLEY).

USUAL flying meetings will be held this week-end.

PUBLICATIONS RECEIVED.

The Scientific Determination of the Merits of Automobiles. By Dr. A. Reidler. London: The General Oil Publishing Co., Ltd., 6, Broad Street Place, E.C. Price, cloth, 21*s.* net.

How to Understand Aeroplanes. By S. L. Walkden. London: Percival Marshall and Co., 66, Farringdon Street, E.C. Price 1*s.* net.

Technical Report of the Advisory Committee for Aeronautics for the Year 1912–13. Teddington: The National Physical Laboratory, Bushy House. Price 10*s.*

CORRESPONDENCE.

Brakes for Aeroplanes.

[1866] With reference to Mr. Frank Brook's letter appearing in the current issue of your paper on above matter, I should like to state through your columns that I designed an aeroplane brake, some time ago, which design was referred to in my letter appearing in FLIGHT for October 26th, 1912. The brake can be fitted to either monoplane or biplane, and acts upon the wheels of the landing chassis, and being now in a position to proceed with the matter, I have communicated the design to the Royal Aircraft Factory, and shall also be pleased to give particulars to any builders of aircraft who may be interested.

81, Church Hill, Walthamstow. VINCENT H. MAIR.

Climbing Speeds of Machines.

[1867] In his letter (1,864) Mr. A. M. Coate states that a propeller working efficiently on a machine whose air-speed is 60 m.p.h. would not work efficiently with a following wind of 40 m.p.h. In short, assuming what he has to prove, perhaps Mr. Coate would state why this inefficiency of a propeller when there is a following wind.

W. Wimbledon, S.W. L. G. T.

Lieut Calderara Joins the Savoia Co.

OUR readers will be interested to learn that Lieut. Calderara, one of the first pupils of Wilbur Wright in Europe, and whose name is associated with the design of Avion floats, has joined the Savoia Co. of Milan, the Italian branch of General Aviation Contractors, as technical adviser.

To Help W.A.L. Accident Fund.

A SPECIAL *matinée* is to take place at the Court Theatre on July 3rd in aid of the Women's Aerial League Flying Accident Fund. The programme will consist of five short plays by Major Trevor—"A Marriage of Inconvenience," "Straying a Little," "Limited Liability," "Silence of Gold," "His Wild Oats." Applications for tickets should be addressed to the League Offices, 25, Denison House, Victoria, S.W.

NEW COMPANY REGISTERED.

Glasgow Aviation Synd., Ltd., 133, St. Vincent Street, Glasgow.—Registered in Edinburgh. Capital £750, in £1 shares.

Aeronautical Patents Published.

Applied for in 1913.

Published May 21st, 1914.

12,212. W. JUNGBECKER. Flying machines and balloons.
12,371. G. MEES. Floats for aircraft.
27,078. F. G. LESLIE. Aeroplane.

Published May 28th, 1914.

11,129. W. H. NOSWORTHY AND S. J. PRESCOTT. Aerial machines.
16,200. K. H. FISCHER. Aircraft.
26,932. F. PORSCHE. Aerial machines.

Applied for in 1914.

Published May 21st, 1914.

2,600. W. A. HUTSON AND M. E. FREEMAN. Flying machines.

Published May 28th, 1914.

3,182. L. BLÉRIOT. Starting and landing apparatus for aeroplanes.

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